

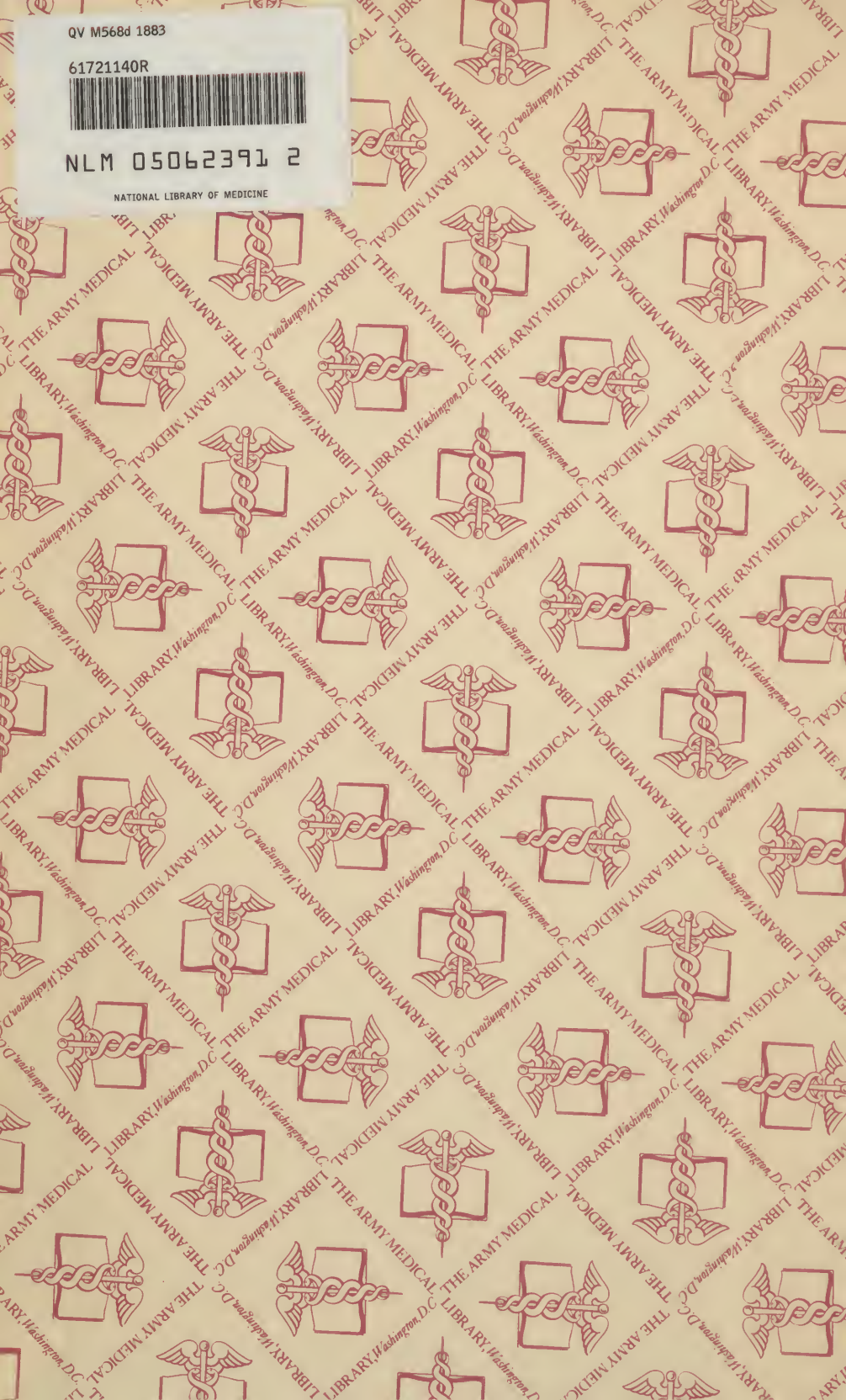
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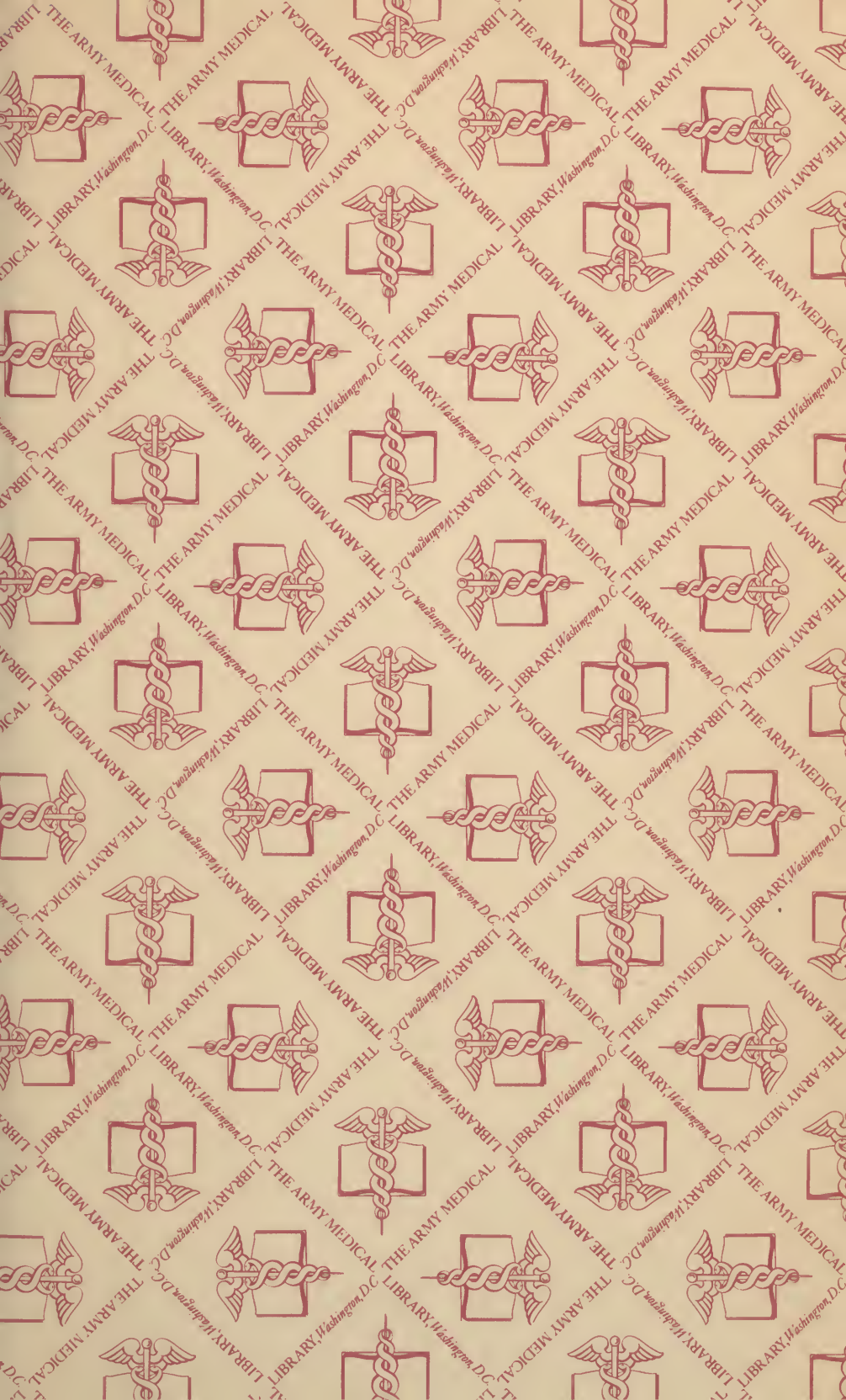
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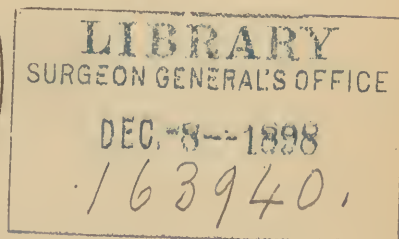


A DIGEST
OF
MATERIA MEDICA
AND
PHARMACY.

FORMING A COMPLETE PHARMACOPŒIA FOR THE USE OF
PHYSICIANS, DRUGGISTS, AND STUDENTS.

BY
ALBERT MERRELL, M.D.

PROFESSOR OF CHEMISTRY, PHARMACY, AND TOXICOLOGY IN THE AMERICAN
MEDICAL COLLEGE, ST. LOUIS, MO. MEMBER OF THE STATE BOARD
OF HEALTH OF MISSOURI.



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DEDICATED

To the Memory

OF

MY FATHER AND PRECEPTOR,

WM. S. MERRELL, A.M., M.D.,

WHOSE LABORIOUS AND PATIENT INVESTIGATIONS,

DURING OVER FORTY YEARS,

HAVE CONTRIBUTED SO EXTENSIVELY TO

EXISTING KNOWLEDGE OF

AMERICAN MATERIA MEDICA AND PHARMACY.

P R E F A C E .

THE object of the writer of the following pages is, briefly stated, to present a condensed statement of such essential facts pertaining to each drug therein described, as will form the ground-work for their rational employment in the treatment of disease.

The spirit of the modern investigator, in every field of science, is selective, elective, or *truly* eclectic, evincing no respect for theory or practice, however aged, which does not invite the most rigid examination before claiming acceptance.

This spirit should especially characterize the medical profession, who should, however, recognize that a rational selection involves a familiarity with the principles and philosophy of all branches of the healing art. Truth is the property of no one school of medical philosophy, and as each possesses special merit, it is the duty, as it should be the pleasure, of progressive and conscientious physicians to dispassionately examine all remedies and curative methods, and exercise in perfect freedom their right to adopt such as commend themselves as useful for the cure, palliation, or prevention of disease. In this spirit this work has been written, and though not willing to unqualifiedly indorse any single dogma of existing schools, it is conceded that to fairly determine their relative merits, the special methods and remedies of each should be employed, whether what is claimed as their fundamental principle is admitted or not.

What is hereafter presented, for reasons more fully given in Part I., relates to single remedies, no mixtures thereof being described or recommended. Under the uses of each the endeavor has been to distinguish clearly between the poisonous and curative action of a drug, and to clearly indicate, when possible, the abnormal condition in a tissue or organ it influences, which constitutes the physical expression of the

disease. In selecting the matter required to carry out the purpose of this work the writer has availed himself of the experience of others recorded in American and foreign works on kindred subjects. The condensed style of treatment precludes the possibility of giving individual credit except in a few instances. Much that is given is entirely new, so far as the writer is aware, and, as would be expected, all that is written is colored with the personal views of the author. The endeavor to abbreviate may have led to some omissions, and to the adoption of a seemingly dogmatic style of expression, but it is believed the work will prove a useful one, and its statements, in the main, as reliable as from the nature and extent of the subject could be expected.

AMERICAN PHARMACOPŒIA.

PART I. PHARMACY.

INTRODUCTORY.

MODERN Pharmacy is the outgrowth of years of experiment, and to superficial examination seems appallingly complicated. In a work of this character it would be impossible to treat each topic of the subject exhaustively. There are, however, certain general principles, the comprehension of which will make clear the pharmacy of single drugs and the reason for each process. These will be examined in the first part of this work, after a brief description of the necessary appliances for preparing and dispensing the preparations to be described. Descriptions of elaborate apparatus are omitted, as not of practical utility to the ordinary physician or pharmacist. Simple, easily extemporized, or accessible forms are mentioned, believing that they will meet the requirements of daily work in the laboratory or dispensary.

CONTAINERS, LABELS, ETC.

2. Permanent containers for liquids should be ground-stoppered, and of sizes ranging from one pint down to one fluidounce. Powders should be kept in wide-mouth, ground-stoppered (saltmouth) bottles or jars. Most medicines are injured by sunlight, for which reason such permanent containers should be, preferably, of yellow glass; or, if it is not used, all bottles containing essential oils, crystallized chemicals, and the scale preparations of iron, should be coated with asphaltum varnish, black paint, or blue paper. Direct sunlight should never have access to any medicinal substance. The wrappers placed upon articles by their manufacturers should be left upon them until they are transferred to properly-protected permanent containers. Each container should be labelled either with glass labels or neatly printed ones, and in the

latter case should be covered with a transparent varnish, in order that they may be kept clean. *Poisons* should be so marked distinctly, and kept in a closet by themselves. *Corks* should be smooth, free from pores, and clean. *Vials* of flint-glass are to be preferred, and should be cleaned and dried before using.

WATER SUPPLY AND HEATING CONVENIENCES.

3. In cities with water supply in each house, a convenient faucet and drain are all that will be required. In other localities, two buckets, or other similar vessels, one containing clean, soft water, and supplied with a dipper; the other, to be used for rinsings, should be placed convenient to the dispensing-case in shop or office.

Heating appliances are easily arranged where gas is supplied cheaply; but in the majority of cases other means must be utilized. A cheap and convenient apparatus, suitable for the ordinary processes conducted on a small scale, can be made as follows: Fit an ordinary earthenware flower-pot, five or six inches in its largest diameter, into a suitable support, such as the ring of a retort-stand, or a ring bracket such as is used for oil-lamps. Enlarge the opening in the bottom of this vessel sufficiently to freely admit the top of the glass chimney of a coal-oil lamp, and permit the lamp to be raised an inch or two if required. Place a wire triangle across the open end of the vessel, or cover it with a piece of coarse wire gauze. In the latter case, the edge of the vessel should be deeply notched, to permit the escape of products of combustion and not impede the draught. This arrangement, with the addition of pans filled with sand or water, to make sand or water bath, makes a cheap and manageable apparatus, furnishing sufficient heat for most pharmaceutical purposes.

APPARATUS AND IMPLEMENTS.

4. An *iron mortar*, of about half a gallon capacity, with one or two of *wedgewood* or *porcelain*, will be needed. Nos. 1 and 2 *wedgewood* are convenient. A shallow mortar is to be preferred to a deep one for most dispensing purposes, and the curvature of the face of the pestle should coincide with that of the cavity of the mortar. The bottom of the mortar and the face of the pestle, if of *porcelain*, should be rubbed "matt" with sharp sand, to better fit them for the trituration of powders. A small (7-inch) *pill-tile* is all that is actually needed for the extemporaneous preparation of small amounts of pills, although a *pill machine* of brass, cutting 24 three-grain pills, is a convenience.

Three *spatulas*, 3-, 5-, and 6-inch, preferably of the style known as "riveted and balanced handled," will be required. One should be stiff

for manipulating pill masses on the tile, and the others elastic, for use in the mortar and for powders. Two *glass funnels*, half and one pint sizes, should be provided. A *small funnel*, 2- to 4-ounce size, will also be useful. *Evaporating-dishes*, of German porcelain, are desirable, although a single, shallow, porcelain-lined, iron evaporating-dish of one pint capacity will serve for most purposes. Saucers and shallow plates serve a good purpose when the temperature used in evaporation is carefully regulated. Suitable support for funnels and percolators should be provided. A filter or *retort-stand*, or a *tripod* and ring-stand will serve these purposes. A movable shelf, with several bevelled circular openings, makes a convenient support for funnels and percolators.

Percolators, of glass or tin, may be purchased, and should conform as nearly as possible to the description given under percolation, especially if the process is to be used without the prolonged maceration advised in the manufacturing methods recommended in this work.

Drug-mills are furnished by dealers, of various styles and sizes. One should be selected that can be easily and quickly taken apart and cleaned. Thorough washing, drying, and scouring, by grinding dry sawdust through it, is the only effective method of cleaning a drug-mill.

A *mincing-knife*, with sharp, straight edge, and a board, of close-grained wood, such as maple, will be needed for preparing undried vegetable substances for tincturing.

A *tincture-press* is a great convenience, though small amounts of liquid may be expressed by inclosing in a stout piece of new cotton-goods, and squeezing between two strips of board about three inches wide and hinged together at one end.

Filters, of paper, preferably round, and of small and medium sizes, should be provided.

Conical flannel strainers are useful and can be readily made.

All utensils should be kept scrupulously clean and ready for use.

SCALES.—WEIGHTS AND MEASURES.

5. Two sets of *scales* should be provided.

1. A pair of accurate prescription scales, with a set each of metric and apothecaries' weights.

2. A pair of grocers' tea-scales, with a set of avoirdupois weights, sixteen ounces down. A set of Troy weights will also be convenient.

Both the scales should be kept scrupulously clean; and to insure accuracy and durability, the weights of the prescription scales should be lifted with a pair of small pincers. This scale and its weights should be kept in a convenient position on the dispensing counter, and in a glass case, if possible. Its pans should be movable, and, for some purposes,

it is well to have two, thin, accurately-balanced watch-crystals to lie upon them.

Measuring-glasses, or *graduates*, should be marked on one side for fluidounces and fractions thereof, and on the opposite side for cubic centimeters and fractions. Glasses of one and four fluidounces' capacity are convenient. A *minum measure* is also useful.

The formulæ of this work are given in parts by weight, but the above will prove useful and convenient in dispensing and preparing medicines.

COLLECTION OF ORGANIC MEDICINAL SUBSTANCES.

6. Drugs of vegetable origin should, in general, be collected when the part used contains the largest amount of nutrient juices, and hence, of active medicinal matter.

Collect *narcotic plants* during the flowering season.

Roots of annual plants after the seed ripens and the top begins to wither.

Roots of biennial plants in the fall of the first or early spring of the second year.

Roots of perennial plants in the fall.

Barks of trees and shrubs in the spring, at or before the time the leaves appear.

Barks of some non-resinous plants may be collected in autumn.

Flowers just before they are fully opened.

Fruits and seeds when fully ripe.

Woods before budding in the spring.

Boughs or fresh shoots are sometimes used, and should be of the present year's growth.

PRESERVATION OF ORGANIC MEDICINAL SUBSTANCES.

7. Within certain limits the concurrence of all the following conditions is necessary to cause decomposition of vegetable organic substances:

Presence of moisture.

Access of atmospheric oxygen.

A somewhat elevated temperature.

The presence of a nitrogenous substance, whose alteration induces molecular change, as in fermentation.

These being necessary conditions of decomposition, the preservation of organic substances may be effected by the following methods:

1. Removal of moisture by rapid drying.

2. Exclusion of atmosphere by hermetically sealing.

3. Refrigeration.

4. Removing or rendering inoperative the nitrogenous constituent by the addition of preservative liquids.

Which of these processes is adopted depends on the nature of the drug to be preserved, and the questions of cost and convenience.

The first and fourth are the most common methods.

If *the drug contains no volatile constituent*, rapid and complete drying at a moderate temperature (not over 100° F.), and in a dark place, is the most common and practicable method for large amounts.

Large amounts may be shipped or preserved in the undried state by filling them into tight barrels and adding a few pints of alcohol, the vapor of which permeates and preserves the contents. Small amounts may be put into fruit or other wide-mouth jars, a few teaspoonfuls of alcohol added, and the jars closed and placed in a cool cellar.

If *the substance contains a volatile principle*, complete drying should not be practised, but the drug should be preserved in the undried or partially dried state by means of alcohol or other preservative, or immediately prepared for use.

All vegetable medicinal substances should be carefully garbled and examined as to identity as soon as obtained, and before any treatment for preservation, as above advised. If not convenient to examine at once, they should be kept in a cool place until thus attended to properly.

MINERAL SUBSTANCES AND PURE CHEMICAL SALTS.

8. Native mineral substances, having been identified, should be placed in carefully-labelled containers that will exclude dust and air. Pure chemical salts are liable to change from absorption of water (deliquescence), loss of water (efflorescence), and the action of light. They should, therefore, be kept in ground-stoppered containers, of amber glass, or glass shielded by paint or paper (See. 2).

PREPARATION OF POWDERS FOR USE IN SUBSTANCE, AND FOR PERCOLATION, ETC.

9. Powders of readily friable chemicals, sugars, gums, resins, and mineral substances are readily prepared by the use of the mortar, and do not require special directions. Most plants and parts of plants are difficult to powder; and when wanted very fine for administration in substance they should be purchased of dealers having facilities for performing such work on a large scale.

Powders from drugs to be treated with a liquid for the purpose of

removing its soluble constituents are prepared of different degrees of fineness. These degrees are usually designated by numbers indicating the number of meshes to the linear inch of the sieve through which the powder will pass.

The object of powdering being to increase the surface for contact with the solvent to be used, a good general rule is to powder as fine as possible without injurious drying. Excessive drying to make a drug grind easily is to be avoided.

When a drug is soft and yielding in texture, or the solvent to be used contains water, or is diluted alcohol, the powder should not be coarser than what will pass a No. 30 sieve. If the drug is compact in nature and the solvent is alcohol, no fear need be had of powdering too finely.

Undried drugs should be finely divided with a mincing-knife (Sec. 4), and then thoroughly bruised in a mortar. The same preparation is required for maceration.

NEUTRAL SOLVENTS.

10. Neutral solvents are such as do not alter the chemical constitution of the substances which they dissolve. The most important ones used in pharmacy are alcohol (sp. gr. at 60° F. 0.820), diluted alcohol (sp. gr. at 60° F. 0.918), water, glycerine, sulphuric ether, benzine, benzol, carbon bisulphide, and chloroform. Diluted alcohol is intermediate in its solvent power and range between alcohol and water. Glycerine partakes more of the solvent power of water than of alcohol, but is wider in its range than water, though it fails to dissolve many substances soluble in alcohol. The other liquids mentioned, especially chloroform and ether, possess remarkable solvent powers, but on account of their nature and cost are restricted to but few uses in pharmacy. Special applications of each of the solvents mentioned will appear in Part II., where they are individually considered. Water and alcohol being the most frequently useful of all the neutral solvents, it will be proper to consider their powers in relation to the most important proximate principles of vegetable drugs. These may be conveniently divided into two general classes, medicinal and non-medicinal; and a brief statement of the relations of alcohol and water to each class will make clear the principles underlying each process, in which one or the other is selected as a solvent.

These statements will be of the most general character, as the name and solvent of the medicinal constituents of each drug will be found under its heading in Part II.

Medicinal Principles.*Soluble in alcohol.*

Resins and resinoid substances.
 Oleo resins and resinous oils.
 Alkaloids as found in each drug.
 Essential or volatile oils.
 Glucosides.
 Neutral bitter principles.
 Tannic acid astringents.
 Vegetable acids.

Non-Medicinal Principles.*Insoluble in alcohol.*

Gums.
 Starches.
 Vegetable albumen.
 Pectin.

Soluble in alcohol.

Chlorophylle.

Most fixed oils are insoluble in both alcohol and water. Castor-oil, which is freely soluble in alcohol, is a notable exception to this general statement.

Water, hot or cold, dissolves all the non-medicinal class, and also the medicinal class, except resins, resinoids, and essential oils (partially).

Chlorophylle, the green coloring matter of plants, dissolves in alcohol, but not in water, and is the only proximate non-medicinal principle of much importance that alcohol does dissolve.

A careful consideration of these statements will show that *alcohol is an almost universal solvent of the medicinal principles of plants, in their natural combinations, unchanged by chemical action.* The most notable exceptions to this statement are the active principle of the senna family (which is an acid or glucoside in combination with an earthy base, and in this form is insoluble in alcohol), and the most active constituents of ergot, which are soluble in water, but not freely in strong alcohol. Others of minor importance exist, but they are not so numerous or so important as to invalidate the general statement made as to the solvent powers of alcohol.

Attention is also called to the fact that *alcohol does not dissolve any of the most common non-medicinal principles except chlorophylle.* Its relation to the two classes are, therefore, such as to make it an excellent agent for their separation. It dissolves the one (medicinal) and rejects the other (non-medicinal).

Alcoholic solutions, therefore, represent in an eminent degree the medicinal virtues of a drug separated from the non-medicinal. It is true the separation is only approximate, but the facts stated are too significant, in their relations to the principles of pharmacy, to be ignored. The valuable preservative properties of alcohol give to such solutions the desirable property of permanence. Water dissolves only part of the medicinal principles enumerated and all the non-medicinal. As the latter includes the peculiar nitrogenous substances, the presence of which promotes retrograde changes of solutions, it is evident that water

alone is suitable only for such as are to be immediately used. Hence the imperfections of decoctions, infusions, etc.

In selecting a solvent for an unknown drug of vegetable origin it is a good rule to use alcohol sp. gr. .820.

Solutions of inorganic substances in neutral solvents are usually permanent.

CHEMICAL SOLVENTS.

11. These include all liquids which form new chemical combinations in the process of solution. They may be either acid or alkaline in character. The class *aceta* (Sec. 14) is an example of the use of an acid solvent, diluted acetic acid being used in their preparation. An *acid solvent* is used upon drugs of vegetable origin in cases where it is intended to convert an alkaloid principle into a soluble salt, either on account of greater permanence, solubility, or for its removal from other associated principles.

Alkaline solvents are not very common in pharmacy, and when used it is usually for solution by saponification of resinous or oily substances. Such special applications will appear in Part II.

MACERATION AND PERCOLATION.

12. An examination of the essential principles and conditions of success in the employment of these two processes will be necessary to their intelligent application in cases in which they are directed. In pharmacy both are applied for the purpose of separating, by bringing into solution the active medicinal constituents of a drug from the inert principles with which they are associated.

Whenever a liquid has dissolved as much matter as it is capable of holding in solution at a given temperature, it is said to be *saturated*.

When a drug has been treated with a liquid until nothing soluble remains, it is said to be *exhausted*. It is necessary to carefully distinguish between complete exhaustion of all soluble matters, and what has been termed the *practical medicinal exhaustion of a drug*. The amount of dissolved matters commonly called "*extract*" is not an index of its medicinal value, unless the solvent is capable of dissolving medicinal principles, to the exclusion of non-medicinal (Sec. 10). A solvent capable of dissolving the latter as well as the former might be saturated, and yet fail to represent fully the medicinal value of the drug treated. When a soluble substance is placed in contact with a suitable liquid, solution continues until *either the liquid is saturated or the substance is dissolved*. The rapidity with which this is accomplished depends on conditions which will be stated hereafter.

When a drug containing both soluble and insoluble matters is treated with a liquid, solution is governed by the same conditions. The resulting liquid may or may not be saturated, depending on the amount of soluble matter present. The drug may or may not be exhausted, this depending on the nature and amount of the solvent used. The more nearly the solvent is capable of dissolving the medicinal and excluding the non-medicinal constituents, the less liquid will be required to accomplish the practical medicinal exhaustion of the drug, for the reason that its solvent capacity is expended upon the first class only. The general nature and uses of solvents, with the principles which indicate their proper selection, are treated of elsewhere (Sec. 10).

Maceration is a term used for prolonged contact of a drug with a liquid termed the "menstruum," for the purpose of dissolving its soluble portions. The soluble constituents are so intimately associated in the drug with others that are insoluble, that thorough division by powdering, grinding, mincing, or bruising is necessary to expose a large surface of soluble matters to the immediate contact of the solvent. Most drugs are filled with minute capillary openings pervious to liquids at a slow rate. Thorough division facilitates solution by increasing contact. During maceration, the menstruum is in constant, though usually imperceptible, motion, due to the gravitation of more or less nearly saturated, and thus heavier, portions of the liquid, and the movement upward of the lighter portions. Changes of temperature also influence these movements in a similar manner. The movement referred to takes place both between the particles of the drug and through its capillary openings. The circulation induced as just explained brings a fresh surface of soluble matter in constantly renewed relation to a fresh and less nearly saturated portion of the liquid. The rate of solution thus progressively decreases until *either all the soluble constituents are dissolved or the liquid is saturated. In either case the circulation of the menstruum ceases, and the liquid is uniform in density and amount of dissolved matters, both between and within the particles of the drug.* The portion of liquid which can be removed by filtration or expression at this stage is of the same medicinal strength as what remains in the drug. *The liquid removed, therefore, represents the drug in exactly the proportion its weight bears to the menstruum used in maceration.* Occasional agitation to distribute the dissolved matters uniformly throughout the menstruum, and thus bring a less nearly saturated liquid in contact with soluble matter, facilitates solution. *Time* is a necessary condition in maceration. Four to eight days are required with most drugs before the circulatory movement of the menstruum practically ceases.

A moderately elevated and uniform temperature also facilitates solution.

Percolation is a process having for its object the exhaustion of a drug in the shortest possible time, and with the least possible amount of liquid. If the exhaustion of the drug and the saturation of the menstruum were attainable simultaneously, the process would be perfect. To obtain, approximately, this theoretically perfect result in the least possible time is the object of percolation.

Solution takes place as described under maceration above, the saturated portions of liquid accumulating in the lower part of the vessel, which must not be disturbed. The soluble constituents having been softened by a preliminary moistening and maceration of the drug, the menstruum readily dissolves them, and is removed from the bottom of the vessel as soon as saturated.

The essential conditions of the process are as follows: The drug containing the matters to be dissolved, suitably divided and after a preliminary moistening and maceration, is arranged in a vertical column, whose height is several times its diameter. The menstruum is then caused to traverse it at so slow a rate that, as the column of liquid gravitates, it passes through the capillary openings in the particles of the drug with nearly the same rapidity as between them. By this arrangement, successive layers of the drug are submitted to the action of the same portion of the liquid, and the *surface of contact* of each such portion is largely multiplied. The very slow rate at which the body of the liquid moves, enables the heavier portions to reach the exit of the apparatus as fast as it escapes therefrom. The *surface of contact* being so largely increased, the *time of contact* required is correspondingly decreased.

Pereolation may be conducted under the most favorable circumstances in an apparatus called a *percolator*, which is a cylindrical, or, preferably, a conical vessel of glass or well tinned iron, the bottom of which is flat or slightly convex, and contains an aperture of a size to admit a No. 5 vial cork. Its height should be six to eight times its largest diameter, and it may taper to a diameter at the bottom one-half that of the top.

With this or similar apparatus prepared, the following are the other important points of the process:

Suitable grinding, crushing, or mincing, for the purpose of increasing the surface of contact of the menstruum with the soluble matter. This is treated of in Sec. 9.

Preliminary moistening, in order to soften the constituents of the drug, and bring them into a condition for rapid solution. The amount

of liquid required in order to have the drug thoroughly permeated and swollen, will vary with the drug and with the alcoholic strength of the menstruum. *As much should be used as the drug will fully absorb*, and eight to ten hours should elapse before transferring to the percolator, in order that the object shall be fully accomplished.

Prepare the percolator by placing in the bottom a disk of heavy flannel, blanket, or felt covered with another of unglazed or filtering paper. Connect, by any suitable means, with the lower aperture of the percolator a rubber tube of small diameter (about three-sixteenths of an inch inside), and pass its free end into a bottle to serve as a receiver for the percolator. By elevating or depressing the receiver or percolator, the flow of liquid can be regulated or stopped entirely. The drug having been properly moistened, pass it through a coarse sieve or rub between the palms of the hands, to break up lumps.

Then pack it in the percolator, layer by layer, evenly and uniformly, rather increasing the pressure toward the top of the vessel. If the solvent is alcohol, pressure should be very firm. If alcohol and water, or glycerine, or both, pack the drug moderately for hard and compact drugs, and very hard for loose and spongy ones.

Cover the drug in the percolator with a disk of muslin, blanket, or filter paper, confining it with bits of glass or clean gravel, and pour on the menstruum until the air is displaced and the liquid stands at a depth of a quarter of an inch above the drug.

Macerate at least forty-eight hours, avoiding disturbance of vessel, in order that a saturated liquid shall accumulate in the lower portion of the apparatus through circulatory maceration. (See above, under *Maceration*.)

Start the percolation by loosening the cork, or, if a delivery-tube is prepared, by depressing the receiver or elevating the percolator until the liquid drops at a rate equal to the weight of the drug in twenty-four hours, or for small amounts of drug, at about the rate of one drop per minute at the beginning of the process.

Keep the surface of the drug covered to a uniform depth with fresh solvent throughout the process. This can best be attained by arranging for an automatic supply of liquid by covering the percolator with a disk of heavy cardboard or other similar substance, containing an opening, through which is passed a section of small rubber tubing, attached to the neck of an inverted bottle containing the solvent, in the same manner as for the delivery-tube. The free end of the tube should just dip below the surface of the liquid in the percolator.

The process is completed when the desired amount of liquid has been collected or the drug exhausted. The latter may be considered as

accomplished when the liquid has lost taste and color, or when the specific gravity of the last portions received is the same as before contact with the drug.

When mixtures of alcohol, glycerine, and water are used, the liquids are often parted or separated to a certain extent, portions of the glycerine being retained by the drug, and the alcohol passing through. In such cases the percolate may still contain soluble matter, and yet the specific gravity be no greater than the mixed menstruum used.

As to the relative merits of maceration and percolation, the former is preferable when the saving of time is not an especial object, as it furnishes more uniform and satisfactory results in the hands of inexperienced persons. *Percolation*, in skilled hands, saves time and produces good results, but is liable to the probable objection of introducing personal errors in manipulation when used by inexperienced persons.

The process recommended in this work is maceration, with expression of as much as possible of the liquid, or *an alternate process*, combining maceration with subsequent percolation or displacement until the required weight of product is obtained. The fundamental principle of both is maceration until movements of solution practically cease (see *supra*). The subsequent percolation is used simply to remove the dissolved matter when expression is inconvenient or ineffectual.

Perecolators, such as are usually sold in the shops, will serve for all the processes of this work, if the full time for maceration is given in each case. The tall, slender variety recommended above is preferable when percolation is to be conducted without this thorough preliminary maceration.

STANDARD OR UNIT OF STRENGTH.

13. The nomenclature of the classes of preparations described in the following sections will conform to that now prevailing in pharmacy, with such limitations in definition of terms as will make their meaning more specific. These definitions appear at the beginning of each section.

In determining upon a standard or unit of strength for each class, it is assumed that the *same weights of different lots* of the same kind of drug, gathered at the same period of its growth, and in localities where it is indigenous, and *treated with the same solvent under similar conditions, will yield, approximately, the same weights of mixed proximate principles of similar medicinal value*. As has already been stated (Sec. 12), the *weight* of soluble matter obtained is not an index of its value medicinally. Its *quality*, as determined by its value in opposing pathological departures from a healthy standard in a tissue it influences,

is the real point to be guarded. This can only be done by treating crude drugs of uniform quality with uniform solvents, by appropriate methods and under uniform conditions.

In this work each preparation is so adjusted as to represent in strength a *definite multiple or fraction by weight of the drug from which it is made*. The *standard or unit strength* is the *dry crude drug*, the *pure chemical*, or the *pure proximate principle*, as described in Part II.

The weight of drugs that are plants or parts of plants (roots, barks, etc.), which, from their nature, should be manipulated in the dried or partially dried state, is calculated from the loss sustained by a sample selected and dried for the purpose.

The *unit of strength* is termed the "normal" (after the analogous use of the word in preparing solutions for volumetric analysis), the letter "N" being used for its abbreviation.

The strength of preparations compared with the "normal" is indicated by a fraction-like symbol, the numerator of which is the letter "N," with or without a number placed before it, and the denominator a number only. The denominator indicates the number of parts by weight required of the preparation to represent the amount of the "normal" expressed by the numerator.

A tincture which represents its own weight of the drug, or "normal," from which it is made would thus be a "normal" tincture, and its strength expressed in symbol, as $\frac{N}{1}$. A tincture of half the strength, a "semi-normal," tincture, $\frac{N}{2}$; thus, *Gelsemium Tincture*, $\frac{N}{2}$, indicates that *two parts* of tincture, $\frac{N}{2}$, represent *one part* of the "normal," or drug, or that it is a "semi-normal" tincture. The symbol $\frac{3N}{10}$ would indicate that ten parts of the preparation to the name of which it was affixed contained 3 parts of the "normal," or drug. *Jalapa Extract*, $\frac{4N}{1}$, expresses the fact that the extract is 4 times the strength of the "normal."

The use of this symbol will prevent mistakes, and will indicate at a glance the dose of any preparation when that of its "normal" is known.

ACETA. Medicated Vinegars, $\frac{N}{10}$.

14. *Solutions of the medicinal constituents of drugs in diluted acetic acid.*

Take of the drug in powder, <i>one part</i>	.	.	.	.	.	.	1
Diluted acetic acid, <i>ten parts</i>	.	.	.	.	.	.	10

Macerate in a vessel of glass, porcelain, or stoneware for ten days, agitating the mixture twice a day. Transfer the mixture to a conical glass percolator, and permit the liquid to pass out in drops, returning it until it runs clear. When the last of the liquid has disappeared from

the surface of the drug add diluted acetic acid, and keep the surface covered until the solution obtained weighs *ten* (10) *parts*.

AQUÆ MEDICATÆ. Medicated Waters.

15. *Solutions of volatile substances in distilled water.*

(a) Prepared from essential oils of the strength $\frac{N}{500}$.

of the oil, <i>one part</i>	1
Precipitated phosphate of calcium, <i>four parts</i>	4
Distilled water, <i>five hundred parts</i>	500

Rub the oil with the phosphate of calcium; then gradually add the water and filter through paper.

(b) Waters of strengths, other than in *a*, by special processes described under the drug in Part II.

CATAPLASMATA. Cataplasms.

16. *Cataplasms, or poultices, are extemporaneous topical applications, moist and pasty in consistence, and composed of powdered substances, solutions, or oils, thoroughly mixed together with water.* Linseed meal, obtained from oilcake after expression of linseed oil, is the most common basis for poultices. Its mucilage retains moisture, and emulsifies oily substances that may be added to prevent the tendency to cause a wrinkled, sodden, and white appearance of the surface to which the poultice is applied.

Various powdered drugs (as mustard, charcoal), or chlorinated, or other deodorizing or antiseptic solutions, may be added to the linseed meal poultice to modify its action. Ground flaxseed may be used without addition of oil, but should be freshly ground, as its oil is likely to become rancid, rendering the poultice irritating.

Ground *ulmus fulva* forms an excellent basis for poultices, and is superior in some respects to linseed meal.

The addition of glycerine is a great improvement to most poultices, as it retains moisture with great tenacity, and is also antiseptic.

CERATA. Cerates.

17. *Medicated unctuous mixtures of a consistence sufficiently soft to spread without warming, and that will not melt by contact with the skin.*

The simple cerates mentioned below may be medicated with drugs whose local action it is desired to utilize in this form, as follows:

Powders.—Incorporate while the cerate is semi-liquid, adding the powder in small portions, and mix thoroughly together until cool.

Aqueous Solutions.—Warm the liquid to a temperature of about 45°C. (110°F.), and add in small portions at a time to the cerate while still soft enough to permit uniform admixture.

Tinctures.—Add to the cerate while still liquid, and at a moderate heat stir the mixture until the alcohol has evaporated, and afterward until cool.

Solid Extracts.—Rub the extract with water in a warm mortar to a smooth paste, and incorporate with it the cerate added in small amounts.

Cerates should be kept at a uniform temperature, not exceeding 15.5°C. (60°F.), owing to the liability of some of them becoming rancid. Cerates containing yellow wax keep better than those with white wax, and those containing benzoated lard than those with plain lard.

Emplastra.—Plasters are intended to be pliable and adhesive at the temperature of the body, and for this reason are firmer in consistence than cerates. They are usually prepared by large manufacturers, and for this reason a description of the methods of preparing them is omitted, except in special cases, to be found in Part II.

CERATUM SIMPLEX. Simple Cerate.

Take of White wax, <i>one part</i>	.	.	.	.	.	.	.	1
Lard, <i>two parts</i>	.	.	.	.	.	.	.	2

Melt together on a water-bath, and stir until cool.

CERATUM BENZOATUS. Benzoated Cerate.

Take of Yellow wax, <i>one part</i>	.	.	.	.	.	.	.	1
Benzoated lard, <i>two parts</i>	.	.	.	.	.	.	.	2

Melt the wax, add the lard, remove from heat, and stir until cold.

Either of foregoing cerates are suitable for extemporizing cerates by methods before given.

DECOCTA. Decoctions, $\frac{N}{10}$.

18. *Solutions prepared from drugs with water, by slow boiling*, and of the strength $\frac{N}{10}$, except in cases of poisonous articles and others of special strengths to be designated by the physician prescribing. (See remarks under Infusions.)

Take of the drug, coarsely crushed or bruised, <i>one part</i>	.	.	.	.	.	.	.	1
Cold water, <i>ten parts</i>	.	.	.	.	.	.	.	10

Place together in a suitable covered vessel, heat slowly to boiling, maintaining the temperature at that point for half an hour. Allow it to cool to about 50°C. (122°F.), strain and pass through the strainer water sufficient to make *ten* (10) *parts*.

EXTRACTA. Extracts.

19. *Soft-solid residues obtained by the evaporation of liquids containing the soluble constituents of crude drugs. As the yield of extract varies with the drug, its strength should always be expressed upon the label by a symbol. (Sec. 13.)*

Take of the drug, carefully dried, if fresh, and reduced	
to a fine powder	Any quantity.
Alcohol or solvent, directed in Part II.	Sufficient.

In a wedgewood mortar, porcelain dish, or other non-metallic vessel of suitable capacity, mix with the powder sufficient of the solvent to thoroughly moisten it; cover the vessel and allow the mixture to stand for two hours. Break up all lumps by passing the mixture through a coarse sieve, or by rubbing loosely between the palms of the hands. Prepare a percolator as directed in Sec. 12, and transfer the mixture to it. Introduce a small portion at a time and pack it gently, layer by layer, evenly and uniformly. Cover the drug with a disk of muslin, blanket, or filter paper, confining it with pieces of glass or coarse gravel. Pour on the solvent until it begins to drop from the lower orifice, which should then be closed, and the liquid added to the uniform depth of one-quarter inch above the drug. Cover the percolator and allow it to remain in a moderately warm place for seven days. Start the percolation, receiving the liquid in drops at a rate equal to the weight of the drug in 24 hours. Keep the surface of the drug covered with the solvent throughout the process, continuing until the tincture received weighs twice as much as the drug. Evaporate the tincture in a porcelain or well-tinned vessel, heated by a water-bath until reduced to the consistence of a soft solid. On a large scale, the alcohol may be recovered by distillation.

EXTRACTA SICCA. Dried Extracts, $\frac{4N}{I}$.

20. *Powders obtained by evaporation of tinctures with addition of sugar of milk sufficient to make the dry residue equal one-fourth the weight of the drug from which it is made.*

Take of the recently dried drug, in fine powder, four parts	4
Alcohol, sp. gr. 820, sufficient	q. s.

Proceed as with *Extracta*, Sec. 19, until the proper amount of tincture is obtained. Evaporate a small fractional part, by weight, of this tincture in a weighed watch-glass or porcelain dish of small size, until it ceases to lose weight. From the weight of the extract thus obtained, calculate the total amount in the tincture. Add sugar of milk, in powder, sufficient to make, with the estimated extract, when dry, *one* (1)

part. Evaporate in a porcelain dish at the temperature of a water bath until dry. Lastly, powder the residue and keep in well-stopped bottles.

EXTRACTA SACCHARATA. Saccharated Extracts, $\frac{N}{1}$.

21. *Powders obtained by evaporation of tinctures with addition of sugar of milk sufficient to make the dry residue equal in weight that of the original drug.*

Proceed as in Sec. 20, adding sugar of milk sufficient to restore the original weight of the drug.

GLYCERITA. Glycerites.

22. *Solutions in glycerine or admixtures with a combination of glycerine and starch, of definite weights of medicinal substances.*

a. *Solutions of strength, $\frac{N}{5}$.**

Take of the drug, <i>one part</i>	.	.	.	.	.	.	.	1
Glycerine, <i>four parts</i>	.	.	.	.	.	.	.	4

Place the drug in a porcelain or wedgewood mortar, and gradually add the glycerine, triturating the mixture constantly until the substance is dissolved, or a uniform mixture is obtained. If not clear, transfer to a stoppered bottle, place the bottle in cold water, and gently heat the mixture with occasional agitation until clear.

b. *Mixtures of strength, $\frac{N}{10}$.**

Take of Starch, <i>one part</i>	.	.	.	.	.	.	.	1
Glycerine, <i>five parts</i>	.	.	.	.	.	.	.	5
Distilled water, <i>three parts</i>	.	.	.	.	.	.	.	3

In a porcelain or wedgewood mortar, triturate the starch with the glycerine added in small portions, until a uniformly smooth cream is formed. Transfer it to a porcelain dish, rinsing the mortar with the water. Gradually heat the mixture to 240° F., stirring constantly until the granules of starch are completely broken and a translucent jelly is formed, free from white spots. Remove it from the fire and stir until cooled to 150° F. This forms a basis (glyceritum amyli) with which other substances may be incorporated, in the proportion of *one part* of the drug to *nine parts* of the glycerite, used while still hot (150° F.) if necessary.

INFUSA. Infusions, $\frac{N}{10}$.

23. *Aqueous solutions of the soluble constituents of drugs obtained by maceration, or digestion, in hot or cold water.*

* The same manipulation will apply when it is desired to make the preparation of other strength than that named.

This class of solutions are similar to decoctions, differing only in that a lower temperature is employed in their preparation. They can be kept unchanged but for a limited time, and are usually prepared in the sick-room. The quantity of infusion to be made from a given weight of drug should be determined by the physician in each case. When ordered without such direction, *ten parts* of infusion should be made from *one part* of drug. The same remarks apply to decoctions.

Take of the drug, crushed or well bruised, *one part* . . . 1
 Water, boiling (a) or cold (b), according as a hot
 or cold infusion is ordered *Sufficient.*

(a) Place the drug in a suitable vessel provided with a cover; pour into it boiling water, *ten (10) parts*; cover it and allow it to stand *two hours* to cool; strain and pass cold water through the strainer, sufficient to make *ten (10) parts*.

(b) Thoroughly moisten the drug with cold water and allow it to macerate for *two hours*; introduce into a percolator, pressing it finely and uniformly, and add water sufficient to make the percolate weigh *ten (10) parts*.

Infusions may be preserved by evaporating at a gentle heat to two-thirds, and restoring their original bulk by adding alcohol; or they may be sealed in small vials while hot, and opened as used, being kept in a cool place or on ice.

LIQUORES. Solutions.

24. *Solutions of various drugs, not included in preceding classes, usually in water, of special strengths, and in many cases requiring special manipulation.*

Directions will be found under individual drugs or under Liquors in Part II.

In nomenclature and strength they usually correspond to the same class in the U. S. P.

A symbol, as directed in Sec. 15, should be affixed to each label.

OLEO-RESINÆ. Oleo-resins, $\frac{4N}{T}$.

25. *Mixtures of fixed or volatile oils, or both, with more or less resin and other constituents, extracted by alcohol, sp. gr. 0.820, and adjusted in strength to represent four times the weight of the drug from which they are obtained.*

These preparations are introduced in place of the class bearing the same name, officinal in the U. S. P., which are extracted by ether, and bear no defined relation to the drug.

Take of the recently dried drug, in powder, No. 40, *sixteen parts* 16
 Alcohol, sp. gr. 0.820 *Sufficient.*

Pack the powder in the dry state into a percolator, of the tall, slender variety (Sec. 12), and pour on the alcohol until it begins to drop from the lower aperture, which should then be closed. Add alcohol until the drug is covered to the depth of $\frac{1}{4}$ inch. Cover the percolator, and allow the contents to macerate, without disturbance, for *seven days*. Start the percolation, receiving the liquid in drops, as directed in Sec. 12, until there is obtained of tincture *one* (1) *part*. Set this aside, and continue to add alcohol until a second tincture, weighing *thirty parts*, is obtained. Evaporate or distil the alcohol from the second tincture, and evaporate the residue on a water-bath until it weighs *three* (3) *parts*. Mix thoroughly with the reserved tincture, and strain through muslin if necessary.

Note.—In a few cases it may be necessary to omit reserving a portion, but evaporate the entire tincture until the product weighs 3 parts, and then add alcohol sufficient to make 4 parts.

OLEA. Oils.

26. *Under this general title will be included both fixed and volatile oils, whether of organic or mineral origin, prepared by distillation, expression, or found native.*

(a.) Volatile or Essential Oils.

Oils usually prepared by distillation with water from the plants in which they exist, or in which they are produced by the action of a peculiar ferment on other compounds present. Most volatile oils contain carbon and hydrogen, or carbon, hydrogen, and oxygen. The first are hydrocarbons, of the composition $C_{10}H_{16}$, or a multiple thereof. The second are usually mixtures of a lighter or liquid portion termed *elæopton* ($C_{10}H_{16}$ or $C_{10}H_{14}$, usually), with oxidized hydrocarbons, commonly solid, and termed *stearoptens*, or, sometimes, camphors, which volatilize at a higher temperature and congeal when cool. A few volatile oils have a pungent, disagreeable odor, and are *sulphuretted compounds*. The specific gravities of volatile oils vary from 0.85 to 1.17 (one case), but they are usually lighter than water. Though their boiling-points are, in the majority of cases, above $140^{\circ} C.$ ($284^{\circ} F.$), their vapors are readily carried over with that of water at $100^{\circ} C.$ ($212^{\circ} F.$). The odors of plants are usually due to their volatile oil. These oils readily oxidize by contact with air, and therefore should be kept in well-stopped bottles protected from light. The addition of from 3 to 5 per cent. of alcohol is recommended to retard change in these oils.

Solubility.—Soluble in alcohol, benzine, chloroform, carbon bisul-

phide, and ether, and sufficiently in water only to impart their odor thereto.

Tests.—*Alcohol.* Loss in volume on shaking with an equal bulk of glycerine or water; red coloration on agitating with dry red analine; softening of dry acetate of potassium when shaken with the oil. *Fixed oils.* Permanent greasy stain left on paper; imperfect solubility in alcohol. *Cheaper volatile oils.* Changing of odor as the oil evaporates from paper.

For description of individual essential oils, see Part II.

(b.) Fixed Oils.

Fixed oils or fats are usually mixtures of two or more fats of different fusing points, some of which are liquid, others solid, at ordinary temperatures. Liquid fats are usually compounds of the radical *glyceryl* (C_3H_5), of which glycerine is the hydrate ($C_3H_5.3HO$), with one or more of the acidulous radicals of *oleic* ($C_{18}H_{34}O_2$), *erucic* ($C_{22}H_{44}O_2$), or *hypogæic* ($C_{16}H_{30}O_2$) acids. Solid fats are compounds of *glyceryl* (C_3H_5), with the radicals of one or more of the following fatty acids: *stearic* ($C_{18}H_{36}O_2$), *palmetic* ($C_{16}H_{32}O_2$), *myristic* ($C_{14}H_{28}O_2$), *lauric* ($C_{12}H_{24}O_2$), or *butyric* ($C_4H_8O_2$).

The fats are named from the acids olein, stearin, palmetin, laurin, etc. They are all lighter than water, varying in specific gravity from .860 to .956. Fats are not inflammable at ordinary temperatures, but burn at a high temperature, as from a lamp. They are not capable of distillation without decomposition, and leave a permanent stain on paper when dropped thereon in a liquid state. Such fats as solidify by exposure to atmospheric oxygen are termed drying oils; those not thus affected, non-drying oils. Fats gradually become rancid from exposure, and therefore should be kept in a cool, dark place, protected from the air.

Solubility.—Soluble in chloroform, ether, benzine, benzol, and carbon bisulphide. Cold alcohol dissolves them but slightly, but hot alcohol takes them up and redeposits them on cooling. They are insoluble in water.

Tests.—Mixtures of drying and non-drying oils may be detected by triturating 8 parts of oil with 1 part of chlorinated lime. A non-drying oil will separate as a clear layer on standing.

Special distinguishing characteristics appear under description of each oil in Part II.

RESINA. Resins.

27. *Isolated resinous principles prepared by precipitation from alcoholic tinctures of drugs.*

Take of the drug, in powder, No. 40, *one part* 1
 Alcohol, sp. gr. .820, *sufficient* q.s.

Proceed as directed in *Extracta* (Sec. 19), obtaining of tincture *two* (2) *parts*.

Distil off the alcohol by means of a water-bath until reduced to a syrupy consistence, and with constant stirring add it to water, *five parts*, previously cooled to a temperature of about 40° F. Permit the precipitate to subside, decant the supernatant liquid, and wash the precipitate twice with additional portions of water. If the resin is to be powdered, expose it in thin layers to the air, in a cool, dark place, until dry; then reduce to powder.

SPIRITUS. Spirits.

28. *Solutions of various volatile compounds in alcohol.*

Processes and strengths vary with different articles, and, therefore, will be described under the appropriate drug in Part II.

In both British and United States Pharmacopœias this class includes solutions of essential oils in alcohol. In this work such solutions will be classed as *tinctures* of strength, $\frac{N}{10}$. (See *infra*.)

SUPPOSITORIA. Suppositories.

29. *Mixtures of medicinal substances with a basis of such a character that it will liquefy by absorption of moisture, or by increase of temperature from contact with the body.*

Process.—*With oil theobroma, cacao-butter.*

Take of the drug,
 Oil theobroma, of each, *sufficient* q.s.

When mixed and divided into equal portions to make the required number of suppositories, each containing the proper amount of the drug, and weighing grs. 30 = gm. 2.00.

Thoroughly incorporate the drug with a small portion of the oil theobroma by rubbing on a pill-tile or mortar; then add the remainder of the oil, previously melted and cooled to a temperature of 95° F. Mix thoroughly and pour into moulds, previously cooled, and kept so by placing them on ice or in cold water; or the mixture may be stirred until cool, and of such consistence as to be divided into the requisite number of parts, each of which may be shaped into conical or other desired form with a spatula.

SUPPOSITORIES.—Continued.

30. *With gelatine and glycerine base.*

Take of Gelatine, *three parts* 3

Soak in water until softened, drain off the water, and melt by means of a water-bath with

Glycerine, *seven parts* 7

This forms the basis, to which add the drug previously mixed with, or dissolved in alcohol, *one (1) part*.

Keep the mixture well stirred until nearly cool, then pour it into small moulds of the required number and capacity.

This base is incompatible with tannin. (See note to Sec. 31.)

SUPPOSITORIES.—Continued.

31. *With soap and glycerite of starch.*

Take of Powdered soap, *two parts* 2
Glycerite of starch, *one part* 1

Incorporate the drug with these ingredients in the proportions named, and in quantity sufficient to make the required number and size of suppositories, which may be shaped with a spatula, or by pressing into moulds. The mass must be manipulated without heating, and powdered starch may be incorporated in sufficient amount to produce the proper consistence.

Note.—The formulæ in Secs. 29 and 30 are to be preferred to that in 31, which, however, may be useful when the other constituents are not at hand. By taking *one part* of the vegetable gelatine of commerce known as Agar-agar (obtained from *Fucus amansii* and other species of the Japanese algæ), soaking over night and heating in 20 parts of water, and then adding 10 parts of glycerine, a base results, which may be used with tannin in any proportion for vaginal suppositories.

SYRUPI. Syrups.

32. Simple Syrup.—*A concentrated aqueous solution containing 65 per cent. of its weight of pure cane-sugar.*

Medicated Syrups.—*Concentrated aqueous or slightly alcoholic solutions of medicinal substances, containing sufficient sugar to preserve them.*

Medicated syrups may be simple or compound. A large number of the syrups in common use are of the latter class. From their composite nature, and the complicated character of processes for their preparation, a description of the latter would be out of place in this work, which is devoted to the pharmacy of single drugs. The following formulæ for simple syrup, and general description of the method of preparing syrups from vegetable substances, will be sufficient to produce good results.

SYRUPUS SIMPLEX. Simple Syrup.

33. Take of Refined cane-sugar, *thirty-five parts* 35
 Distilled water, *sixty-five parts* 65

Mix together, heat to the boiling-point, and strain through muslin or flannel, adding hot water through the strainer sufficient to make *one hundred (100) parts*.

SYRUP FROM PLANTS OR PARTS THEREOF.

35. Take of the drug in powder,
 Diluted alcohol, of each *Sufficient.*

From each part of drug make *two parts* of tincture, as described under Extracts (Sec. 19). Distil or evaporate this tincture by means of a water-bath until the alcohol is all removed, and adjust the weight of the residue by evaporation or addition of water until it represents *40 per cent.* of the weight of the syrup it is intended to make. Filter if necessary and add

Refined Sugar *60 per cent.*

of the required finished weight of the syrup. Warm gently, or if volatile principles are present, agitate together until the sugar is dissolved, strain, restoring the full weight, if short, by means of water added through the strainer. Any prepared tincture in proper amount to represent the required weight of the drug may be used in above process. When alcohol is not contraindicated, syrups may be extemporized by adding simple syrup to a tincture in such amount as to represent the required strength of drug.

Note.—No drug which contains resinous or oleaginous principles to any great extent is adapted for preparation in the form of permanent syrup. A sweetened tincture of such drugs may be prepared by adding simple syrup to the tincture, with constant stirring, as long as no muddiness or permanent precipitate appears, and noting the degree of dilution. Simple syrup may be used as the vehicle for their extemporaneous preparation for administration, but such mixtures are not clear nor desirable preparations.

SYRUPS FROM SUBSTANCES WHOLLY SOLUBLE IN WATER.

36. Take of the drug,
 Simple syrup, of each *Sufficient.*

Triturate the drug in a mortar, with the syrup added in small portions, until complete solution is effected. If difficult, solution may be

hastened by transferring to an evaporating dish, after thorough admixture, and gently heating.

FRUIT SYRUPS.

37. Take of the recently expressed and clarified

Juice of the fruit, <i>six parts</i>	6
Refined sugar, <i>nine parts</i>	9

Mix, heat to boiling in a non-metallic vessel and strain.

Above directions, while not sufficient for all syrups in common use, will cover most cases. Special manipulations will be given, together with the strengths of syrups, in Part II.

TINCTURÆ. Tinctures.

38. *Solutions in alcoholic menstrua of medicinal substances or their soluble constituents.*

The dry drug,—the proximate principle or the chemical substance being the unit of strength or “normal,” the nomenclature of the following classes will indicate their strength in relation to the standard. They include most of the tinctures recommended in this work.

The strength of a few, which do not come under these classes, will be indicated by the symbol whenever they are mentioned in Part II.

NORMAL TINCTURES, $\frac{N}{I}$.

39. *Tinctures from plants or parts of plants representing their own weight of the drug from which they are prepared.*

Therapeutically, these preparations are equivalent to the best fluid extracts of commerce. As many of the drugs from which tinctures are made are injured by thorough drying, they must be manipulated in the undried or partially dried state. As the amount of water present in undried organic substances varies widely, the “normal” or standard will be the amount of dry drug present, estimated as hereafter directed.

NORMAL TINCTURES FROM DRY DRUGS, $\frac{N}{I}$.

40. Take of the dried drug in fine powder, <i>ten parts</i>	10
Solvent directed in Part II., <i>ten parts</i>	10

Macerate in a closely covered vessel at the ordinary temperature for *ten days*, agitating thoroughly twice a day. Introduce the mass into a tall, slender percolator previously prepared (Sec. 12). Settle it well by jarring the vessel; run off and return the liquid until it passes clear and free from floating particles of drug. Cover the surface of the drug

with a disk of muslin, paper, or blanket, confining it to its place by fragments of glass. Start the percolation at the rate of about one drop per minute, and as the tincture disappears from the surface, supply fresh solvent until the total amount of tincture obtained shall weigh *ten (10) parts*.

Note.—It will be noticed that in place of the usual directions for *packing*, as in ordinary percolation, a simple jarring of the percolator is directed. The reason for this will appear on reflection. The solution of all soluble matter has already been effected by the prolonged maceration, and the liquid is uniform in density. It is introduced into a percolator simply to *displace* the liquid by fresh solvent. To effect this the packing is superfluous. The liquid is permitted to drop from the percolator at such a slow rate that the entire body of tincture, both between and within the particles of drug, gravitates, and is displaced by fresh solvent, which, on account of its less specific gravity, does not materially mix with the tincture. (See Maceration and Percolation, Sec. 12.)

NORMAL TINCTURES FROM FRESH NON-RESINOUS DRUGS, $\frac{N}{T}$.

41. In a weighed quantity of fresh, undried drug, estimate the percentage of *dry drug* present, as follows: Rapidly dry, by artificial heat, a carefully selected average specimen of the drug, weighing, say 100 grains. Weigh the residue carefully, and its weight in grains represents the percentage of dry drug present. The loss represents the percentage of moisture present.

Take of the undried drug an amount sufficient to represent of the
dry drug, *ten parts* 10

Mince it finely upon a chopping-board (Sec. 4), or in other convenient manner, and expose it in a thin layer to the action of the air, but protected from light, until it has dried sufficiently to

Weigh *fourteen parts* 14

Bruise or grind into a coarse powder, and mix it thoroughly with

Alcohol, sp. gr. .820, *four parts* 4
Diluted alcohol, *two parts* 2

Macerate in a closely covered vessel at ordinary temperature for *ten days*, agitating thoroughly twice a day. Introduce the mass into a percolator and displace the tincture as directed in Sec. 40, using for the purpose diluted alcohol, specific gravity 0.918.

Continue the process and obtain

Tincture, *ten parts* 10

Note.—In above process it is essential that every undried drug contains water equal in amount to *at least fifty per cent. of the weight of the dry drug present.* Should it contain less, for each one part of water add one part of alcohol and sufficient diluted alcohol to make the total solvent equal the weight of *dry drug present.*

NORMAL TINCTURES FROM FRESH RESINOUS DRUGS, $\frac{N}{1}$.

42. Estimate the dry drug present as in Sec. 41.

Take of the undried drug an amount sufficient to represent of the
dry drug, *ten parts* 10

Mince it finely upon a chopping-board (Sec. 4), or in other convenient manner, and expose it in a thin layer to the action of the air, but protected from light until it has dried sufficiently

To weigh *twelve parts* 12

Bruise or grind into a coarse powder, and mix it thoroughly with

Alcohol, sp. gr. .820, *eight parts* 8

Macerate in a closely covered vessel at ordinary temperature for *ten days*, agitating thoroughly twice a day. Introduce into a percolator and displace the tincture as directed in Sec. 40, using for the purpose a mixture of

Alcohol, *eight parts*; water, *two parts*; sufficient to obtain of tincture,
ten parts 10

Note.—By *non-resinous drugs* are meant such as do not depend for their activity upon the presence of resins, oleo-resins, or volatile oils, and which therefore do not, as a rule, require full-strength alcohol as a solvent.

By *resinous drugs* are meant those whose active constituents require alcohol for solution on account of their resinous or oleo-resinous character (Sec. 10). With the first sufficient water is left in the drug to constitute *one-half of the weight of the solvent*, the other half being of alcohol. With resinous drugs, *twenty per cent.* of water is permitted to remain, and *eighty per cent. of alcohol* added to make the solvent (seventy-three per cent. nearly). As the drying is accomplished without artificial heat, the injury to the drug is not as appreciable when the above amounts of moisture are allowed to remain.

SEMI-NORMAL TINCTURES, $\frac{N}{2}$.

43. Two parts of tincture representing one part of drug.

SEMI-NORMAL TINCTURES FROM DRY DRUGS, $\frac{N}{2}$.

Take of the Dry drug, in fine powder, <i>ten parts</i>	10
Solvent directed in Part II., <i>twenty parts</i>	20

Macerate in a closely-covered vessel at the ordinary temperature for *ten days*, agitating thoroughly twice a day. Replace any loss from evaporation with fresh solvent. Mix well and transfer to a stout piece of new muslin, express strongly, and filter the tincture thus obtained if not clear. If expression is not convenient, introduce the mass into a tall, slender percolator, and displace the liquid as directed in Sec. 40, continuing the process with the solvent directed until there is obtained of the tincture *twenty (20) parts*.

SEMI-NORMAL TINCTURES FROM FRESH NON-RESINOUS DRUGS, $\frac{N}{2}$.

44. Estimate the dry drug and water present as in Sec. 41.

Take of the undried drug an amount sufficient to represent of the dry drug, <i>ten parts</i>	10
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Since it finely upon a chopping-board (Sec. 4), or in other convenient manner, and expose it in a thin layer to the action of the air, but protected from light, until it has dried sufficiently to weigh *eighteen (18) parts*.

Bruise or grind it to a coarse powder, and mix it thoroughly with

Alcohol, sp. gr. .820, <i>eight parts</i>	8
Diluted Alcohol, sp. gr. .918, <i>four parts</i>	4

Macerate in a closely-covered vessel at the ordinary temperature for *ten days*, agitating thoroughly twice a day. Replace any loss from evaporation with diluted alcohol. Mix well, transfer to a stout piece of new muslin, express strongly, and filter the tincture thus obtained if not clear. If expression is not convenient, introduce the mass into a tall, slender percolator, and displace the tincture as in Sec. 40, using sufficient diluted alcohol until there is obtained of tincture *twenty (20) parts*.

Should the water in the fresh drug taken not equal four-fifths the weight of the dry drug present, add one part alcohol, specific gravity .820 for each one part of water present, and sufficient diluted alcohol to make the total solvent *twenty parts*, and proceed as above directed.

The object is to have the solvent of the specific gravity .918, *i. e.*, diluted alcohol.

SEMI-NORMAL TINCTURES FROM FRESH RESINOUS DRUGS, $\frac{N}{2}$.

45. Estimate the dry drug as in Sec. 41.

Take of the undried drug an amount sufficient to represent of the
dry drug, *ten parts* 10

Mince it finely, and dry, as directed in Sec. 44, until the

Weight is reduced to *fourteen parts* 14

Bruise or grind to a coarse powder, and mix thoroughly with

Alcohol, sp. gr. .820, *sixteen parts* 16

Macerate in a closely-covered vessel at the ordinary temperature for *ten days*, agitating thoroughly twice a day. Replace any loss from evaporation with a mixture, of alcohol, *eight parts*, water, *two parts*. Mix well; transfer to a stout piece of new muslin; express strongly, and filter the tincture if not clear. If expression is not convenient, displace, as in Sec. 40, using sufficient of the mixture, of alcohol, *eight parts*, water, *two parts*, to obtain of the tincture *twenty (20) parts*.

**DECI-NORMAL TINCTURES FROM DRUGS WHOLLY SOLUBLE
IN ALCOHOL, $\frac{N}{10}$.**

46. *Ten parts of tincture, representing one part of drug.*

Take of the drug, *one part* 1
Alcohol, sp. gr. .820, *nine parts* 9

Dissolve the drug in alcohol, and filter the tincture if necessary.

**DECI-NORMAL TINCTURES OF DRUGS PARTIALLY SOLUBLE
IN ALCOHOL, $\frac{N}{10}$.**

47. Take of the dry drug or sufficient of the undried drug to represent *one part* 1
Alcohol, sufficient to make, with the estimated water present (unless other solvent is directed in Part II.),
ten parts 10

Reduce the drug to a coarse powder by mincing and bruising. Macerate in a closed vessel for *ten days*, agitating frequently. Transfer the mixture to a stout piece of new muslin and express strongly; filter if necessary. Instead of expressing after maceration the mass may be transferred to a percolator, and displace with fresh solvent as directed in Sec. 40, until the weight of tincture obtained is *ten (10) parts*.

QUINTI-NORMAL TINCTURES, $\frac{N}{5}$.

48. *Five parts of tincture, representing one part of drug.*

Take of the drug, as directed in Part II.,	one part	.	.	.	.	1
Solvent	"	"	"	"	five parts	5

Reduce the drug to a coarse powder by mincing, grating, or bruising ; add the solvent ; macerate *ten days*, agitating freely ; express the tincture, and filter or transfer to a percolator, and displace (Sec. 40) of tincture *five (5) parts*.

TRITURATIONS. Triturations.

49. *Thoroughly triturated mixtures of medicinal substances, prepared by the methods and with the proportions by weight in use in Homœopathic Pharmacy, and known as the Decimal Scale (Decimal "potencies").*

Trituration by the method described hereafter originated with the homœopathic school, and, to prevent confusion, is here adopted without change.

Note.—The term "potency," a name originally introduced by Hahnemann, is sometimes applied to these preparations, and is retained by his followers, who claim that the "molecular division or atomization of the medicinal substances becomes, by trituration, more and more subtle the higher the potency goes." That "it is an erroneous and wrong idea to consider, in examining and criticising homœopathic potencies, the quantity of the medicinal substance, and to attempt to fix the value of its molecular quality by the fraction representing the quantity of the original substance." That, "by the atomization or molecular division," the rules which apply to matter in bulk, *eo ipso*, are rendered inapplicable in the determination of efficiency, as proportioned to weight and measure. "New laws appear, which must not be construed *a priori*, but must be found *a posteriori* by experiment and observation." That, "as the name does not denote the value of a thing, and as every one who wishes to give his judgment must, besides, endeavor to form for himself, by study and observation, a clear and proper idea of the qualities of these remedies and their effects on other organisms." And since "several thousands of homœopathic practitioners have confirmed the correctness of Hahnemann's observations and conclusions on the efficacy of the potencies," the old designation introduced by him is retained.—*Pharm. Homœo-Polyglottica*.

Criticism of these statements would not be in place here. Common justice requires that with the adoption of their method, the explanation of its originators for trituration and potentializing of drugs, should also

be given. The lower triturations are coming into use among liberal physicians to a considerable extent, which is the explanation of the introduction here of this form of preparation.

Take of the crude dry drug, <i>ten parts</i>	.	.	.	.	.	.	10
Sugar of milk, <i>ninety parts</i>	.	.	.	.	.	.	90

Divide the sugar of milk into three parts. In a porcelain mortar, the bottom of which is rubbed "matt," or rough, with wet sand, introduce the drug and 30 parts of the sugar of milk, and triturate with pressure for six minutes. The powder is then to be scraped from the sides and bottom of the mortar towards the centre, and any portion adhering to the pestle removed in the same manner, occupying about four minutes in the process. The trituration is then repeated for a second six minutes, followed by a second scraping. The second portion of 30 parts of sugar of milk is then added, and the trituration and scraping repeated twice, as before. Lastly, add the third portion of 30 parts of sugar of milk, and repeat the process twice for the third time. This is practically the method of homœopathic pharmacy.

10 parts of drug with 90 parts of Sugar of Milk will give the 1st Trit.	
10 " 1st Trit. " 90 " " " " 2d Trit.	
10 " 2d Trit. " 90 " " " " 3d Trit.	
etc., etc., etc.	

As there are two scales used in homœopathic pharmacy, the decimal and centesimal, the foregoing should be designated thus: 1st, D, or Dec; 2d, D, or Dec, or as often written, 1^x, 2^x, 3^x, etc.

They may also be designated by symbol in agreement with the general method of this work, thus: $\frac{N}{10}$, $\frac{N}{10^2}$, $\frac{N}{10^3}$, $\frac{N}{10^4}$, etc.

Triturations from fresh vegetable or animal substances are prepared in the same manner as the above, except that 20 parts of the drug and 90 parts of sugar of milk form the 1st trituration. The 2d, 3d, etc., are made as above described.

UNGUENTA. Ointments.

50. *Unctuous preparations of a consistence like that of firm lard, or that will slowly liquefy by contact with the body.*

Most ointments are best prepared extemporaneously, by mixing with a fatty basis or simple ointment, the required amount and form of medicament. *When the drug is in solution*, add the liquid in small amounts to the melted simple ointment, and stir constantly until the solvent has evaporated. Remove from the source of heat, stir, and beat the mixture as it cools, until perfectly homogeneous and uniform in appearance.

When the drug is a solid, reduce to a powder, and triturate with a

small portion of the simple ointment, until the mixture is smooth and free from gritty particles; then add the remainder of the ointment in small amounts at a time, and thoroughly incorporate it. This operation may be performed in a mortar, or, with small amounts, on a pill-tile, with a spatula.

When the basis is not specified in Part II., either of the following simple ointments may be used.

Adeps Benzoatus, as described in Part II.

Petrolatum, as described in Part II.

UNGUENTUM SIMPLEX. Simple Ointment.

Take of Lard, <i>eighty parts</i>	. . . . .	80
Yellow wax, <i>twenty parts</i>	. . . . .	20

Melt the wax, and gradually add the lard, stirring constantly until cool.

UNGUENTUM PARAFFINI. Paraffine Ointment.

Take of Paraffine oil,* <i>seventy parts</i>	. . . . .	70
Yellow wax, <i>thirty parts</i>	. . . . .	30

Mix the oil with the wax previously melted, and stir until cold.

NOMENCLATURE OF CHEMICALS.

51. The Latin titles adopted in Part II. for chemical salts or solutions correspond to those used in the United States Pharmacopœia, with a few exceptions, in which it was thought other titles would more correctly indicate the *nature* of the substance. It will be conceded that this course is a wise one, as it will prevent the confusion necessarily arising from different names for the same drug. For a similar reason, where there are definite solutions bearing names already well known, such names are retained. A few unimportant alterations have been made in the strength of some of these preparations. These changes are introduced as a matter of convenience, and to avoid fractions in the expression of their composition in parts by weight, or in order to express a percentage strength. There are also introduced a few preparations not recognized in the U. S. P., but which are known in foreign pharmacy, or such as are deemed useful additions. Many of the titles used are indefinite unless qualified by English synonyms, and are adopted not because they are considered the best, but to prevent the confusion incident to radical changes. Examples of the kind

* A limpid, oily, neutral liquid paraffine, specific gravity 0.840—0.845, free from colored, fluorescent, or odorous constituents, and boiling at 360° C. (680° F.). It is known to commerce as paraffine oil, or spindle oil.

alluded to are ferri phosphas, ferri chloridum, ferri sulphas, etc., which do not indicate whether a ferrous or ferric salt is meant. A literal translation into Latin form of their scientific English titles would give us ferrieus phosphas for ferric phosphate, ferricum chloridum for ferric chloride, ferrosus sulphas for ferrous sulphate; all of which are much more definite and satisfactory as scientific titles, and which are also known in foreign pharmacopœias, though in slightly modified form (sulphas ferrosus, phosphas ferrieus, chloridum ferricum, etc.).

NOMENCLATURE OF DRUGS OTHER THAN CHEMICALS.

52. The nomenclature of plants in Part II. differs from that of the U. S. Pharmacopœia in that both the generic and specific names are employed instead of the first only. This course is adopted to avoid confusion when several species of the same are in use. In a few instances, where a name is well established by long usage, and but one species is employed, it is retained.

The nomenclature of preparations from plants or parts thereof is explained in preceding sections of Part I. The qualification of the term "tincture" by the use of a specific prefix, or a symbol indicating its strength in reference to a defined standard or unit of strength, we believe will commend itself to every thoughtful person. The fact that in so many instances they are made from fresh material instead of from dry, as in the U. S. P., and that the working formulæ are adjusted to parts by weight, justifies, it is thought, such change in the nomenclature as will serve to distinguish those prepared by new processes and standards from those by the old. The change does not introduce complications in the matter of dose, but removes all uncertainty which might exist as to the strength of preparations wanted when ordered or prescribed. (See dose hereafter.)

DESCRIPTION AND COMPOSITION OF CHEMICALS.

53. Chemical preparations and mineral substances of definite composition are described briefly, and their molecular formulæ given in accordance with the new chemical notation. The primary rational formula and molecular or atomic weight of each is given, believing that they will usefully supplement the description, and assist any who may wish to calculate the reactions occurring in the preparation or combination of chemical substances. Under the head of solubility are named the ordinary liquids capable of dissolving the substance under consideration, and in many cases the degree of solubility of each substance is also specified. Unless otherwise stated, the temperature of such solubility is understood to be 15.6° C. (60° F.). This information is constantly

utilized in the dispensing or prescribing of substances of the character under consideration.

DESCRIPTION AND CONSTITUENTS OF PLANTS.

54. No effort is made at the description of plants other than to indicate the natural order to which they belong, in addition to the specific and generic names. The names of a botanical authority describing the plants under the same title is also given, and will serve as reference to any who may wish to consult such description. It is believed that this plan will be the most useful one, as the ordinary descriptions given are not usually sufficient to satisfactorily settle questions of identity.

The proximate principles of each plant are enumerated, together with a brief description of each and their symbolie formulæ, when known, their solubility or otherwise in alcohol, water, or other common solvents. This information furnishes the rational groundwork for the proper selection of a solvent (Sec. 10), or the determination of the most eligible form of preparation in which to use the drug.

TESTS OF CHEMICALS.

55. Methods are given under each chemical, in Part II., for the detection of the most common impurities that are liable to be present. Success in the use of these methods will depend upon the judgment of the manipulator, his care in their application, and a correct interpretation of the phenomena observed on bringing each reagent in contact with the substance to be tested. These phenomena consist in changes of color, bulk, odor, or the formation of precipitates or sublimates, whose states of aggregation, color, apparent quantity and solubility, or otherwise in excess of test or other solution, are evidence of the presence or absence of certain substances. In most cases but a few drops of the solution of the reagent need be added in order to produce the characteristic change upon which the test depends. When a solution, after the removal by precipitation of one or more substances, is to be tested for others, the reagent used to produce the first precipitate should be added in quantity to insure its complete removal.

Solutions of most reagents should be added drop by drop, as an excess will, in some cases, redissolve a precipitate upon which a test depends. Solution of calcium hydrate and sulphuretted hydrogen, as a rule, require to be used in excess.

All tests are applied on a small scale, usually in test tubes, small beakers, porcelain capsules, crucibles, or watch-glasses.

The strength of solution of reagents will be found in a table in the

appendix. All such solutions should be kept in glass-stoppered bottles, and such as are liable to decompose readily, should be prepared in but small amounts.

SPECIFIC GRAVITY.

56. By the specific gravity of a substance is understood a number expressing the ratio between its weight and that of an equal bulk of pure water, both taken at the same temperature. 15.6° C. (60° F.) is understood when no other temperature is specially mentioned.

To obtain the specific gravity of a solid or liquid, the rule is,

Divide the weight of the substance by the weight of an equal bulk of water at the same temperature.

$$\text{Specific gravity} = \frac{\text{Weight of substance.}}{\text{Weight of equal bulk of water.}}$$

The method of obtaining the weight of an equal bulk of water varies with the nature of the substance. For this reason different methods are given for obtaining the specific gravity. The following, carefully followed, give accurate results:

SPECIFIC GRAVITY OF LIQUIDS.

1. A platinum weight or piece of compact glass, like a glass stopper, of known weight, is suspended by a long hair or silk thread from one arm of an accurate pair of balance scales, and permitted to enter the liquid whose specific gravity is to be obtained. Its weight, while thus submerged, is noted and deducted from its weight in air. It is then rinsed and weighed in water in the same manner, and the difference between its weight in air and water calculated. The differences thus obtained are the weights of equal bulks of the liquid and water. Divide the first by the last, the quotient is the specific gravity, that is,

$$\text{Specific gravity} = \frac{(\text{Weight of the solid in air}) - (\text{weight of the solid in the liquid})}{(\text{Weight of the solid in air}) - (\text{weight of the solid in water})}.$$

Both liquids must be heated or cooled until at the temperature of 15.6° C. (60° F.), or,

2. By specific-gravity bottle, as follows:—On an accurate pair of scales, carefully counterpoise a small bottle, which has a narrow neck, and is clean and perfectly dry. Fill it about half way up the neck with distilled water, previously warmed or cooled to 15.6° C. (60° F.). Add or remove a few drops of water to make the weight a round number (if convenient a multiple of ten), and mark the height of the liquid with a scratch on the neck. Empty out the

water, rinse the bottle with a little of the liquid whose specific gravity is to be obtained, and which has been heated or cooled to the same temperature as the water; then fill it with the same up to the mark, and carefully weigh. The weight of the liquid, divided by the weight of the water, gives the specific gravity weight. Thus:

$$\text{Specific gravity} = \frac{(\text{Weight of liquid and bottle}) - (\text{weight of bottle})}{(\text{Weight of water and bottle}) - (\text{weight of bottle})}.$$

For convenience, a bottle holding exactly 1000 grains is usually used. Such bottles are readily purchased.

3. By hydrometer. This method is not so exact as either of the preceding. Two kinds are employed; on one the degrees on the stem are arbitrary (as in Baume's hydrometers); on the other, the number on the scale which coincides with the surface of the liquid into which it is placed, expresses the specific gravity. The latter are to be preferred, although the former are in most common use.

The specific gravities corresponding to the degrees of Baume's and other hydrometers, are given in a table in the appendix. In using these instruments, all that is required is to warm or cool the liquid to the temperature of 15.6° C. (60° F.); insert the hydrometer, note the degree to which it sinks, and consult the table for the specific gravity corresponding to it. Two forms of Baume hydrometers are in use; one for liquids heavier, and the other for liquids lighter than water.

SPECIFIC GRAVITY OF SOLIDS.

1. *When insoluble in and heavier than water.*

(a) Weigh the solid in air, and afterwards in water, by suspending in it, as directed above.

$$\text{Specific gravity} = \frac{\text{Weight in air}}{(\text{Weight in air}) - (\text{weight in water})}.$$

(b) *When in powder insoluble in water, by specific-gravity bottle as above described.*

Place the substance, previously weighed, into the bottle, fill to the mark with water, and again weigh.

$$\text{Specific gravity} = \frac{\text{Weight of powder}}{(\text{Weight of powder}) + (\text{weight of bottle and water}) - (\text{weight of bottle and powder})}.$$

2. *When insoluble in and lighter than water.*

Attach the solid to a piece of metal, previously weighed both in air and water, and weigh both in water.

$$\text{Specific gravity} = \frac{\text{Weight of substance}}{(\text{Loss of both in water}) - (\text{loss of metal in water})}.$$

3. *When soluble in and heavier than water.*

Proceed as in 1 *a*, using a liquid which will not dissolve the substance, and whose specific gravity is known. Then,—

(The weight of the substance in air)—(weight of substance in liquid)=(weight of bulk of liquid equal to substance).

Then :

$$\begin{array}{l} \text{Sp. gr. of} \\ \text{liquid} \end{array} : \begin{array}{l} \text{sp. gr. of} \\ \text{water} \end{array} :: \begin{array}{l} \text{weight of} \\ \text{equal bulk of liquid} \end{array} : X = \begin{array}{l} \text{weight of} \\ \text{equal bulk of water.} \end{array}$$

Then :

$$\text{Specific gravity} = \frac{\text{Weight of substance in air}}{\text{Weight of equal bulk of water.}}$$

SPECIFIC GRAVITY OF GASES.

This operation is similar to that of liquids—air, or in some cases hydrogen, being taken as the standard (at 15.6° C., 60° F.).

A globe of from one to four quarts' (or litres) capacity, is suspended from a balance, and counterpoised after exhaustion of air, and the gases successively introduced and weighed. The weight divided by that of an equal bulk of air or hydrogen, whichever is taken as the standard, is the specific gravity sought. Owing to the necessity for corrections for temperature and pressure, the specific gravity of gases are rarely taken by the physician or pharmacist.

SCIENTIFIC TITLES AND PRESCRIPTION WRITING.

57. The Latin language is used in all scientific terminology, for the purpose of conveying an exact and comprehensive conception of the nature of the thing to which the title is applied. The unchangeable character of a dead language peculiarly fits it for this use, and for this reason the appropriateness of the custom is rarely questioned. Owing, however, to a lack of familiarity with the language, the attempts to use it in prescription-writing frequently result in many palpable offences against accuracy, and has caused many physicians to advocate its abandonment for English. It is believed, however, that a complete change in this direction would be objectionable for many reasons, and the following method is suggested as one that will fulfil the requirements, both as to correctness and accuracy, and yet not be too radical or difficult to be understood.

Use the official or scientific titles in all cases, as expressing more fully and exactly the drug intended than is possible in all cases with the English synonyms.

Instead of changing its terminations to make the title and its quali-

fying word agree in case, use it always with the termination given at the head of the description of each drug, and place the word denoting the form of *preparation* wanted after instead of before the title. Thus, instead of Tinctura Ferri Chloridi write Ferri Chloridum *Tinctura*, or Tinct. Instead of Liquor Potassæ write Potassa Liquor. Instead of Tinctura Nucis Vomiceæ write Nux Vomica *Tinctura*, or Tinct.; or, in accordance with the plan of this work, Nux Vomica Tinct. $\frac{N}{1}$ or $\frac{N}{2}$, according as a normal or semi-normal tincture is meant.

In this manner we *first write the official title* of the drug whose action is wanted, and after it the *form of preparation* in which it is to be given and the amount required.

PREPARATIONS.

58. Under this head, in Part II., will be found selected forms for administration, such as experience has proven to be efficacious and convenient. In a large number of cases the fresh, undried drugs are directed to be used, and are to be prepared by methods radically different from those in use, made from the same article, but fully dried. This change in process and form of crude material to be used justifies, or even necessitates, the adoption of a nomenclature for the resulting preparations, which will serve to distinguish them from those in common use.

As the strength of the preparations, in relation to the crude dry drug, is indicated in this name, or a symbol attached thereto, there is no probability of confusion or mistake in their employment. Forms to meet the requirements of special cases may be extemporized from the tinctures by observing the directions given in preceding sections. The relation of the preparations of the U. S. P. to those mentioned are usually indicated in brackets in the text.

USES.

59. The title "uses," occurring in Part II., should not convey the idea that the intention is to enumerate all the purposes to which each drug has been applied.

The effort is rather to select such as have been proven to have well-defined usefulness in the treatment of disease, or to suggest the line of investigation when their real utility is in doubt.

The more definite our knowledge becomes of the relation between the action of a drug and the various conditions in the tissue it influences, the more nearly will the results of its employment, remedially, approximate certainty. Such definite knowledge can only be attained by the employment and study of drugs singly, *i. e.*, not mixed with one another as in the conglomerate pharmaceutical compounds of the day. Such

compounds will not be mentioned in this work, for the reason that its design only contemplates furnishing the material for a rational groundwork to the restudy of our American materia medica; and, as was before stated, this can only be done by their use singly. The chief useful applications of each remedy will be indicated, and, when possible, the symptoms characterizing the conditions existing, when its employment will be most successful. As may be inferred from this statement, the writer believes that a rational method in the employment of drugs involves more than their selection, with no guide but an unsystematic expediency.

At the risk of seeming dogmatical, the following is given as a brief statement of what are claimed to be the principles which should govern the rational application of drugs to the cure of disease:

Health exists where there is painless and normal functional activity of organs or tissues.

Disease exists when there is excess, deficiency, or perversion of functional activity.

The cause of such functional aberration is, proximately, alteration in the nutritive and nervous supply of the part, or in the integrity of its structure.

This condition of the part is manifested by symptoms, upon the accurate interpretation of which depends a clear comprehension of the nature of the condition they express.

Symptoms do not constitute the disease which lies in or back of the condition they express, and is essentially a wrong in the manifestation of life.

To so change the underlying condition as to permit a normal manifestation of life, is to restore health or cure disease.

What we call the properties of a drug, are its capability of producing certain effects on living organisms, which effects manifest themselves as sensation, motion, or their impairment.

The existence of what we call properties depends, not alone on the nature of the drug, but implies a relation between two terms, *i. e.*, the drug and the organism.

Quality, then, results from mutual action between these two terms, and the strength or intensity of this action is simply the ratio between them.

Drugs seemingly manifest an elective affinity for, or influence on, special organs and tissues.

Drugs modify the functions of organs by inducing changed conditions in their tissues, the nature of which changes are indicated by the symptoms.

The character of the condition induced by drug action will vary with the dose, and is first ascertained by its empirical, *i. e.*, tentative employment in health and disease.

To get the curative influence of a drug, such doses must be given as will *oppose* the departure from normal function by an influence upon the nutritive or nervous supply of the diseased part.

The curative influence of a drug will be obtained by a minute dose in one, and a relatively massive dose in the opposite condition. The least dose that will accomplish the intended purpose is a necessity of a rational therapeutics.

The vital force or sum total of manifested life is impaired in disease, or by the injudicious use of drugs.

A rational curative method will not impair vital resistance by the unwise use of drugs or depletive measures, but will preserve and sustain it by all available means.

DOSE.

60. The principles underlying the choice of a proper dose in any given condition are indicated in the foregoing section. The doses given in the text of Part II., are not designed to be used in all cases, but simply to indicate what is considered an ordinarily safe dose, and as a guide to prevent mistakes. Strictly speaking, a definite statement of dose is not possible, as it will vary with the age of patient and character of condition in diseased part. A drug is administered to change an abnormal to a normal condition, and such change is indicated by painless and normal functional activity, the return of or approach to which is a signal for the withdrawal of the remedy or reduction of dose. A drug, therefore, should be employed tentatively, keeping in view the quality of its action rather than the quantity of the dose. Small doses repeated until the desired effect has been produced and then withdrawn, will be found the most rational and safe method in the majority of cases, though there are exceptions to this statement in a few instances.

The usual approximations of weight to measure are employed in many cases, but with the normal tinctures, *one drop* is assumed to represent one grain, the estimate being under rather than over the absolutely correct amount. To be strictly correct, the fluid should be weighed, but dropping, being much more convenient, is substituted. As the doses given are much below the maximum in almost every case, and as it is advised that remedies should *invariably* be administered with the view of producing definite changes in the conditions which the symptoms express, and then withdrawn, the approximations are deemed sufficiently correct.

PART II.

MATERIA MEDICA.

Chemicals	See Secs. 51 and 53, Part I.
Drugs other than Chemicals	See Secs. 52 and 54, Part I.
Tests	See Sec. 55, Part I.
Preparations	See Sec. 58, Part I.
Uses	See Sec. 59, Part I.
Dose	See Sec. 60, Part I.
Prescription Writing	See Sec. 57, Part I.

ABIES BALSAMEA. Canada or Balsam Fir.

The fresh shoots and leaves.

The recent inner bark.

The liquid, oleo-resinous exudation from the bark, known as Canada Turpentine or Balsam. Terebinthina Canadensis. (U. S. P.)

Coniferæ. Miller. Bentley and Trimen.

ABIES CANADENSIS. Hemlock Spruce.

The fresh shoots and leaves.

The recent inner bark.

The prepared resinous exudation found in commerce under the name of Canada Pitch. Pix Canadensis. (U. S. P.)

The distilled oil from the fresh shoots (oil of spruce).

Coniferæ. Michaux. Gray.

ABIES EXCELSA. Norway Spruce.

The fresh shoots and leaves.

The recent inner bark.

The prepared resinous exudation, known in commerce as Burgundy Pitch. Pix Burgundica. (U. S. P.)

Coniferæ. DeCondolle. Gray.

ABIES NIGRA. Black Spruce.

The fresh shoots and leaves.

The recent inner bark.

Coniferæ.

Gray.

Constituents.—All the species of *Abies* enumerated furnish more or less liquid, oleo-resinous exudations, which are locally employed as constituents of plasters to protect, sustain, or stimulate the part. They consist of mixtures of *resin*, more or less *volatile oil*, and small amounts of other substances of minor importance. The barks of each contain *tannin* and *gallic acid* in addition to the resinous balsams. Distillation with water furnishes a stimulating volatile oil, varying in amount with each variety.

Preparations.—From each of the above species of *Abies*,

A tincture, $\frac{N}{2}$, from the shoots and leaves, as in Sec. 45, Part I.

A tincture, $\frac{N}{2}$, from the bark, as in Sec. 45, Part I.

The resinous exudations named under each, freed from impurities. [A thick liquid extract from the *A. can.* is sold in commerce under the name of Extract of Hemlock, or *Pinus Canadensis*, for tanning purposes, and has been extensively used as a local astringent in gleet, etc.]

Uses.—The balsamic constituents of all the species of *Abies* possess similar therapeutic virtues when administered internally, the differences depending on the varying quality of the volatile oil in each. The volatile oil obtained from each of the balsams is isomeric with Oil of Turpentine ($C_{10}H_{16}$), and is therefore to be considered as having similar therapeutic virtues. The tinctures from the barks of the *A. balsamea* and *A. canadensis* are indicated in general asthenia with want of vascular tonicity, mucous membranés pallid, or secreting profusely; in renal, vesical, urethral, vaginal, pulmonary, and gastric catarrhs. The tinctures from the leaves and shoots, in small doses, are used in irritable conditions of the urinary organs, and for same conditions as the bark. The *A. excelsa* will probably serve the same purpose. *A. nigra* is used for certain forms of dyspepsia, indicated by a feeling of weight and constriction at the stomach. These species deserve careful study.

Dose.—Of tincture, gtt. i. to x. = gm. 0.06 to 0.60.

ABSINTHIUM. Artemisia absinthium. Wormwood.

The dried tops and leaves, recently gathered.

Compositæ.

Linnc. Bentley and Trimen.

Constituents.—*Volatile oil*; of a green color, and odor of plant, con-

sisting mainly of absinthol ($C_{10}H_{16}O$); *absinthin* ($C_{16}H_{22}O_5$); a neutral, bitter principle, all freely soluble in alcohol and ether, *tannin*, *resin*, *succinic* (absinthic,) acid all soluble in alcohol, *starch*, *albumen*, and *alkaline salts*.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Used as a direct cerebro-spinal stimulant, affecting especially the medulla oblongata and organs under its influence, through the par vagum. Used principally in dyspepsia, where atony and torpor of the stomach are present; occasionally to destroy lumbrici and ascarides.

Dose.—Of tincture, gtt. i. to xx., cautiously repeated.

A remedy worthy of careful study in hysteria, chorea, and especially in epilepsy.

Artemesia abrotanum. Southern wood, or Old Man.

Artemisia vulgaris. Mugwort.

Two species of the same family as *A. absinthium*, and possessing somewhat similar properties. Neither has been thoroughly examined. They may be used in form of tincture, $\frac{N}{2}$, prepared with alcohol, as in Sec. 43, Part I., and in similar doses to *A. absinthium*. The *A. vulgaris* is recommended in epilepsy of children, chorea, and somnambulism.

ACACIA. Gum Arabic.

The gum obtained from *Acacia vera* and other species of *Acacia*.

Leguminosæ, Mimosææ.

Bentley and Trimen.

Constituents.—Gum-arabic, or arabin, is a compound of calcium with an organic, acidulous radical called the gummie radical, and is therefore gummate of calcium.

Tests.—*Starch*; blue color, when heated with water, and a drop of tincture of iodine added.

Uses.—Used chiefly to suspend insoluble medicines in liquids; to emulsify oils, and to cover the taste of disagreeable medicines; or in solution, as a protection to inflamed mucous surfaces.

ACETONUM, C_3H_6O . M. wt. 58. **Aceton.** Pyroacetic Ether or Spirit.

A colorless, combustible liquid of a peculiar odor, specific gravity .792, and boiling at $56.3^\circ C.$ ($133.3^\circ F.$).

Solubility.—It is soluble in ether, nitrous ether, and volatile oils.

Uses.—Its therapeutic value is not well determined. It is recom-

mended to allay pulmonary irritation and diminish secretion from bronchial surfaces; also in rheumatic and gouty affections, and as an anthelmintic. It dissolves camphor, many resins, and fats.

Dose.—Internally, gtt. x. to xx. = gm. 0.66 to 1.30. By inhalation of watery solution from atomizer.

ACHILLEA MILLEFOLIUM. Yarrow.

The leaves and flowers.

Compositæ, Sececionidææ.

Lin. Bentley and Trimen.

Constituents.—*Volatile oil*; an alkaloid *Achillein*, $C_{20}H_{38}N_2O_{15}$, and small amounts of *resin*, *tannin*, gum, and salts of potassium and calcium. All soluble in alcohol, excepting the gum and salts last mentioned.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part. I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—It directly influences the vascular system of the pelvic viscera and of mucous membranes. Valuable in conditions of atony in these tissues, when as a vascular stimulant it corrects abnormalities due to relaxation and want of tonicity; hence useful in piles with discharge of bloody mucus, leucorrhœa, some forms of menorrhagia and amenorrhœa, and in vesical, renal, and urethral irritation.

Dose.—Tincture, $\frac{N}{I}$, gtt. iij. to xxx. = gm. 0.20 to 2.00 or equivalent.

ACIDUM ACETICUM. Acetic Acid.

An aqueous solution of specific gravity 1.048, containing 36 per cent. of true acetic acid, $HC_2H_3O_2$. M. wt. 60.

ACIDUM ACETICUM DILUTUM. Diluted Acetic Acid.

An aqueous solution of specific gravity 1.008, containing 6 per cent. of true acetic acid.

Solubility.—Both are miscible in all proportions with alcohol and water.

Tests.—*Traces of lead and copper*; a black precipitate with sulphuretted hydrogen. *Hydrochloric acid*; a white precipitate with argentic nitrate. *Sulphuric acid*; a white precipitate with barium chloride or nitrate. *Sulphurous acid*; odor of sulphuretted hydrogen by contact with nascent hydrogen.

Uses.—Given internally, highly diluted, it has the property, in common with other acids, of increasing the alkaline and checking acid

secretions from glands, with whose orifices it may be brought in contact. It allays thirst by increasing the alkaline salivary secretion. Given before meals, it checks excessive acid secretion. Given in moderation with food, it assists digestion by its excitation of the salivary secretion, and by its solvent action on foods. Used in excess, it impairs digestion and nutrition. By enema, it increases alkaline secretion and overcomes constipation. By sponge to the skin, it checks excessive (acid) sweating, and proves refreshing in fevers as a cutaneous stimulant. By fomentation, it is useful for bruises and sprains. By injection, it is used, highly diluted, to check hemorrhage from uterus or intestines. The stronger acid is used, locally, for its superficial caustic action, due to its affinity for the bases of the tissue. Hence, applied with a stick to corns, warts, and vegetations of the skin; also, locally, to porrigo, herpes, and pityriasis, to establish substitutive inflammation.

ACIDUM ARSENIOSUM. Arsenious Acid.

Syn. Arsenious anhydrid or oxide, As_2O_3 . M. wt. 198.

In contact with water it forms a true arsenious acid (H_3AsO_3).

The pure chemical in heavy, partly crystalline, partly amorphous cakes.

Solubility.—Soluble in 10 to 12 parts of boiling water, 30 parts of cold water; slightly soluble in alcohol and insoluble in ether; freely soluble in solutions of alkaline hydrates, and in warm, diluted hydrochloric acid.

Tests.—Fixed mineral impurities will remain as a residue on heating a fragment on platinum foil. The pure oxide is readily and completely volatile.

Preparations.—A solution, $\frac{\text{N}}{100}$ (liquor potassii arsenitis), as follows:

Take of Arsenious oxide, <i>one part</i>	1
Potassium bicarbonate, <i>one part</i>	1
Distilled water, <i>five parts</i>	5

Heat the glass or porcelain vessel until arsenic is dissolved; filter, and add through filter distilled water

Sufficient to make *one hundred parts* 100

May be colored red, as in liquor potassii arsenitis, U. S. P. (Fowler's solution), by substituting spirits lavender com., U. S. P., three parts for same amount of water.

A solution, $\frac{\text{N}}{100}$ (liquor arsenici chloridi), as follows:

Take of Arsenious oxide, <i>one part</i>	1
Hydrochloric acid, <i>two parts</i>	2
Distilled water	<i>A sufficient quantity.</i>

Boil the arsenious oxide with the acid and *twenty-five parts* of water; filter, and add water through the filter sufficient to make *one hundred (100) parts*. (Liq. acidi arseniosi, U. S. P.)

Triturations, as in Sec. 49, Part I.

Antidote.—Ferric hydrate, in tablespoonful doses of the freshly prepared hydrate.

Uses.—A poison, the nature of whose use as a medicine is indicated by its action as an irritant to all the tissues and organs especially presided over by the sympathetic or vegetative system of nerves. Erythism of the nerve centres especially contraindicates its use. In minute doses (and it is never useful otherwise), it is beneficial in atonic conditions of the nervous and nutritive tissue, stimulating both. Useful in skin diseases with eruptions, imperfect nutrition and glandular deposits, in non-inflammatory diseases of the respiratory and digestive mucous membranes or their nerve supply, such as atonic diarrhœa, chronic gastric catarrh, chronic catarrh of the bronchi, and pulmonary mucous membranes; also in respiratory complaints dependent on depression of sympathetic innervation, chronic intermittents, etc.

Dose.—Of either solution, gtt. 1 = gm. 0.06, which represents, approximately, gr. $\frac{1}{16}$.

ACIDUM BENZOICUM. $\text{HC}_7\text{H}_5\text{O}_2$. M. wt. 122. **Benzoic Acid.**

The pure acid in white, feathery plates, or lustrous, friable needles.

Solubility.—Soluble in 500 parts of water at 15° C. (59° F.), in 15 parts of water at 100° C. (212° F.), in glycerine, 10 parts. Freely soluble in alcohol, ether, turpentine, most essential and fixed oils; soluble in concentrated nitric and sulphuric acids, from which it precipitates unchanged on dilution with water.

Tests.—*Hippuric acid*; urinous odor, or a faint odor of ammonia, by heating in a test tube a mixture of 20 parts of the acid, 50 parts dry potassium hydrate, and 50 parts water. *Cinnamic acid*; odor of oil of bitter almonds on rubbing together in a mortar 1 part of the acid, $\frac{1}{2}$ part of potassium permanganate, and a few drops of water. *Mineral impurities*; residue on volatilization or solution in alcohol. *Boric acid*; green color of flame of alcohol containing the acid in solution.

Uses.—The utility of the remedy depends upon its power of rendering the urine acid, thus arresting alkaline fermentation. High colored, strong smelling alkaline urines indicate the cases for its use. It possesses antiseptic virtues similar in character to boracic and salicylic

acids. It has been recently recommended in albuminuria of pregnancy and scarlatina in small doses.

Dose.—Gr̄s. i. to xv. = gm. 0.06 to 1.00, in solution largely diluted.

ACIDUM BORICUM, $H_3Bo_3 \cdot 2H_2O$. M. wt. 80. Boracic, or Boric Acid.

The pure crystallized acid in colorless scales.

Solubility.—Soluble in alcohol, in cold water (26 parts), and in hot water (3 parts).

Tests.—A clear solution should form, on heating in a test tube 1 part acid in 10 parts water. When part of this solution is dropped into alcohol no turbidity should result.

Uses.—Used as an antiseptic and deodorant to prevent decomposition and lessen suppuration of wounds, ulcers, burns, scalds, etc.; as a local application in some parasitic diseases. Saturated solutions are used, as it is free from irritating effects. It may also be used in alcoholic solution for urticaria and pruritis, and in ointment (1 acid, 5 lard), or in fine powder, in eczema.

ACIDUM CARBOLICUM, C_6H_5HO . M. wt. 94. Carbolic, or Phenyllic Acid. Phenol, or Phenic Alcohol.

The pure acid, in crystalline mass without color, melting at $35^\circ C$. ($95^\circ F$.).

Solubility.—Slightly soluble in water, freely so in glycerine, alcohol, ether, chloroform, acetic acid, and in volatile and fatty oils.

Tests.—Odor; appearance; complete solution of fused acid in twice its volume of liquor potassæ, which should remain limpid on dilution with three times its bulk of water.

Preparations.—A glycerite, $\frac{N}{5}$, as in Sec. 22, Part I.

A medicated water, $\frac{N}{50}$ (aqua acidi carbolici), as follows:

Take of Carbolic acid, <i>two parts</i>	.	.	.	.	.	.	2
Water, <i>ninety-eight parts</i>	.	.	.	.	.	.	98

Mix thoroughly together.

Uses.—In weak solution (1 to 2 per cent.) it is used as a topical antiseptic to suppurating wounds, ulcers, abscesses, etc. By inhalation, to destroy fetor in gangrene of the lung, chronic ozæna, etc.; also, in whooping-cough, hay asthma, etc. In strong solution (20 per cent.) it is used as a superficial escharotic on account of its power of combining with albumen and arresting inflammation. Applied locally it forms a whitish eschar with but little pain. Deep-seated injections have been

practised in surgical cases with good results, but they require extreme caution. It is also useful as a disinfectant and deodorant to stenches of drains, water-closets, dissecting-rooms, and hospital wards; weak solutions are sufficient for this purpose.

ACIDUM CATHARTICUM, $C_{180}H_{192}N_4O_{82}S(?)$. Cathartic Acid.

A black, amorphous substance prepared from senna leaves, in which it exists in combination with magnesium and calcium. It is decomposed by mineral acids on boiling into glucose and cathartogenic acid.

Organic acids precipitate it from its alkaline solutions, but do not decompose it on boiling.

Solubility.—Soluble in alcohol and alkaline solutions; insoluble in water and ether.

Uses.—Used only as a cathartic. It causes considerable griping pain. (See *Senna alex.*)

Dose.—Grs. ss. to iij. = gm. 0.13 to 0.20.

ACIDUM CHROMICUM, CrO_3 . M. wt. 100.5. Chromic Acid. Chromic Anhydride.

The pure anhydride in crimson, acicular, crystalline masses. Dissolved in water it forms true Chromic Acid (H_2CrO_4 . M. wt. 118.5).

Solubility.—Freely soluble in water. With alcohol, glycerine, nitrous ether, and other easily oxidized substances, it explodes or burns when warmed.

Tests.—*Sulphuric acid*; white precipitate on addition of a solution of barium nitrate to a portion of a diluted solution of the acid, which has been previously boiled with a few drops of hydrochloric acid and a little of alcohol until it turns green.

Uses.—An escharotic, depending for such action on its oxidizing power. It penetrates deeply, though slowly, and is very destructive. It is used for the destruction of warty and malignant growths, condylomata, lupus, hemorrhoids, warts, etc. Should be applied with a pointed glass rod; and care should be taken to avoid healthy tissues, all superfluous acid being removed with lint. Used as a paste, or in solution, $\frac{x}{5}$ (1 part of acid to 4 parts of water).

ACIDUM CHRYSOPHANICUM. $C_{14}H_{10}O_4$. M. wt. 242.
Chrysophanic Acid.

The acid in yellow, lustrous needles, inodorous, and nearly tasteless.

Solubility.—Slightly soluble in water; more so in ether, hot alcohol, and glacial acetic acid, and freely in benzine, benzole, chloroform, and oils.

Tests.—The pure acid dissolves to a red liquid in concentrated sulphuric acid, from which it precipitates unchanged on addition of water.

Uses.—Used in ointment, ($\frac{1}{2}$ to 2 parts in lard, or ungt. paraffini 8 parts), locally, for ring-worm, psoriasis, chloasma, and in parasitic affections. Should not be applied near eyelids. Discontinue on appearance of erythema. Stains of the skin or clothing from the drug may be removed by a weak solution of chlorinated lime.

ACIDUM CITRICUM. $\text{H}_3\text{C}_6\text{H}_5\text{O}_7 \cdot \text{H}_2\text{O}$. M. wt. 210. Citric Acid.

The pure acid in colorless crystals.

20 parts of this acid neutralize $23\frac{1}{2}$ parts potassium carbonate, $28\frac{1}{2}$ parts potassium bicarbonate, 24 parts sodium bicarbonate, $16\frac{3}{4}$ parts ammonium carbonate, or $13\frac{1}{2}$ parts magnesium carbonate.

Solubility.—Soluble in $\frac{1}{2}$ its weight of boiling, and $\frac{3}{4}$ its weight of cold water; less soluble in alcohol, and insoluble in ether.

Tests.—*Metals*; dark turbidity with sulphuretted hydrogen (lead or copper). *Sulphuric acid*; a white precipitate from an aqueous solution acidulated with nitric acid, on adding a solution of barium nitrate.

Preparation.—A syrup (acidum citricum. *Syrupus*), as follows:

Take of Citric acid in powder, <i>two parts</i>	. . . . . 2
Water, <i>two parts</i>	. . . . . 2
Tinct. Oleum limonis, $\frac{6N}{100}$, <i>one part</i>	. . . . . 1
Simple syrup, sufficient to make <i>two hundred and fifty parts</i>	. 250

Dissolve the acid with the water and tincture, and add in small portions to the syrup, shaking after each addition, until the whole is thoroughly mixed.

Uses.—This acid, like acetic, is entirely destroyed in its passage through the organism. Principally used in fevers, in the form of lemonade, to allay thirst by increasing alkaline secretions of oral cavity. Deep redness of mucous membranes exist when acids are useful.

ACIDUM FORMICUM. HCHO_2 . M. wt. 46. Formic Acid.

A colorless liquid, specific gravity 1.235, crystalline at freezing-point, and of pungent odor. It produces a burning sensation applied to the skin, and long continued contact vesicates, and may even cause sloughing.

Solubility.—Alcohol and water dissolve it; its salts are soluble in water.

Uses.—The acid has been used internally as a stimulant, and locally as a counter-irritant in rheumatic pains and neuralgias dependent on sluggish capillary circulation, but is now rarely prescribed. Taken internally, its action on the gastro-intestinal and vesical surfaces is similar to that of cantharides.

In quantities of $\frac{1}{4}$ to $\frac{1}{2}$ per cent., it preserves fruit, juices, vinegar, ink, glue, etc.

ACIDUM GALLICUM, $\text{H}_3\text{C}_7\text{H}_3\text{O}_5 \cdot \text{H}_2\text{O}$. M. wt. 188. **Gallie Acid.**

The pure acid in fawn-colored, slender, acicular crystals, or in crystalline powder.

Solubility.—Soluble in cold water (100 parts) and boiling (3 parts), in alcohol, and to some extent in glycerine and ether.

Tests.—*Tannic acid*; a white precipitate when added to dilute solution of gelatin. *Sugar and dextrine*; residue when acid is treated with alcohol. *Resinous and mineral matters*; floating residue when acid is dissolved in hot water and cooled.

Preparations.—A glycerite, $\frac{\text{N}}{5}$, as in Sec. 22, Part I. (Ung. acidi gallici, U. S. P., $\frac{\text{N}}{15}$.)

Uses.—This substance rapidly diffuses into the circulation, and is used for its power of restraining hemorrhage from and secretions of the mucous surfaces of pulmonary and urinary tracts. Hence its use in hæmoptysis, hæmaturia, pyelitis, catarrh of the bladder, chronic bronchial catarrh, dropsy, albuminuria, and in the sweating of phthisis.

Dose.—Gr. i. to x. = gm. 0.06 to 0.66, preferably in solutions highly diluted, and repeated at short intervals.

ACIDUM HYDROBROMICUM DILUTUM. **Diluted Hydrobromic Acid.**

A colorless, aqueous solution, containing 34 per cent. of pure hydrobromic acid (HBr. M. wt. 81), and having the specific gravity 1.274. 95 parts should saturate 20 parts calcium carbonate. (Acid. hydrobromicum dil., U. S. P., contains 10 per cent. HBr.)

Tests.—*Sulphuric acid*; a white precipitate with barium nitrate or chloride. *Sulphurous acid*; sulphuretted hydrogen evolved on adding pure zinc; recognized by odor or blackening of paper moistened with solution of lead acetate. *Fixed salts*; residue on evaporation.

Uses.—Chiefly used as an adjunct to quinine and iron to prevent head symptoms. It is more transient in its effects than potassium bromide, and does not produce the eruption of the skin which characterizes that drug, though it equals it in its influence on nervous disorders produced by reflex irritation, such as erythism, muscular spasm, whooping-cough, cough from irritation of larynx and bronchi, vomiting, etc. It seems to aggravate epilepsy.

Dose.—In conditions indicated; gtt. x. to xxx. = gm. 0.66 to 2.00, largely diluted with water.

ACIDUM HYDROCHLORICUM. Hydrochloric Acid. Muriatic Acid.

A chemically pure solution of hydric chloride (HCl. M. wt. 36.5) in water. Specific gravity 1.1578, and containing 31.8 per cent. HCl.

ACIDUM HYDROCHLORICUM DILUTUM. Diluted Hydrochloric Acid.

A mixture of 8 parts acidum hydrochloricum with distilled water sufficient to make $26\frac{1}{2}$ parts. Specific gravity 1.038, and containing 10.58 per cent. HCl. (U. S. P., specific gravity 1.049 = 10 per cent. HCl.)

Tests.—*Sulphuric acid*; a white precipitate with a solution of barium nitrate. *Arsenic*; deposit on strip of bright copper when boiled with the acid, which, when dried and heated in a dry test-tube, gives a white sublimate, exhibiting, under a magnifying glass, distinct octahedral crystals of arsenic (As_2O_3). *Sulphurous acid*; odor of sulphuretted hydrogen on warming with fragments of zinc.

Uses.—Internally, highly diluted, this acid is valuable when the tongue is deep red, mouth and tongue dry, coating brown with sordes. Under its use the alkaline secretions of the mouth are increased, thirst and restlessness allayed, and fever thereby lessened. Given after meals, it assists digestion when the secretion of gastric juice is scanty. Given before eating, it arrests the secretion of gastric juice, and hinders digestion. When such secretion is already excessive, it will prove useful in restraining acidity given before eating.

Dose.—Diluted acid, gtt. v. to x. = gm. 0.33 to 0.66, given in water.

ACIDUM HYDROCYANICUM DILUTUM. Diluted Hydrocyanic Acid.

A 2 per cent. solution in water of pure anhydrous hydrocyanic acid (HCN. M. wt. 27); specific gravity of solution, 0.997. (See *Argenti Cyanidum*.)

Tests.—*Sulphuric acid*; a white precipitate with a solution of barium chloride or nitrate, insoluble in nitric acid.

100 parts, to which an excess of solution of the silver nitrate has been added, should yield a white precipitate which, when washed and dried at 100° C. (212° F.), should weigh 10 parts and be wholly soluble in nitric acid.

Antidote.—A mixture of ferrous sulphate, ferric chloride, and either magnesia or sodium carbonate. Emetics. Stomach-pump. Cold water to the spine.

Uses.—On account of its influence on the medulla through the pneumogastric nerve, this remedy is especially useful in irritable conditions of the stomach unconnected with inflammation. Indicated when the tongue is elongated, pointed and red at the tip and edges, with epigastric fulness or uneasiness and painful retching.

Dose.—Gtt. v. = gm. 0.33 to water fʒ iv. = gm. 128.00. Teaspoonful (gm. 4.00) of mixture frequently repeated.

ACIDUM HYDRIODICUM. Hydriodic Acid.

An aqueous solution containing 15 per cent. of gaseous hydriodic acid (HI. M. wt. 128), and of specific gravity 1.112.

It should be colorless; of strongly acid, somewhat astringent taste. It readily decomposes by contact with air, iodine being liberated, which remains dissolved in the acid, coloring it reddish-brown. Its instability makes it necessary that it be kept in a cool, dark place, in small bottles securely stopped.

It is incompatible with alkalies, metals, metallic salts, and all oxidizing agents, such as chlorate and permanganate of potassium, nitric acid, etc., the last three converting it into iodic acid, which is poisonous.

Uses.—Used as an assimilable form of combination, in which to get the systemic effects of iodine and the iodides.

Prepared in the form of syrup, representing in each fluidounce of syrup 40 minims of the acid, it is more permanent. A decided red color of either acid or syrup should cause its rejection.

Dose.—Of the acid, gtt. j. to x. = gm. 0.06 to 0.66; well diluted; repeated several times per day, avoiding iodism.

ACIDUM LACTICUM, $\text{HC}_3\text{H}_5\text{O}_3$. M. wt. 90. Lactic Acid.

The pure solution containing 75 per cent. of hydrated lactic acid, and of specific gravity 1.212.

60 parts of lactic acid require 50 parts potassium bicarbonate to saturate it.

Solubility.—Miscible in all proportions with alcohol, ether, glycerine, and water, and, without being colored, with concentrated sulphuric acid.

Tests.—*Glucose*; Fehling's solution and heat. *Gum and mannite*; turbidity on dropping the acid into a mixture of equal parts of alcohol and ether. *Organic acids*; if excess of lime-water produce immediate turbidity, tartaric or phosphoric acids are present; turbidity after heating only, citric acid; acetic and butyric acids, odor on heating. *Sulphuric acid*; a white precipitate with a solution of barium chloride. *Hydrochloric or phosphoric acids*; solution of silver nitrate gives a white precipitate. *Calcium salts*; white precipitate with a solution of ammonium oxalate. *Metals*; characteristic precipitates with sulphuretted hydrogen.

Uses.—Locally, a 4 per cent. solution, by spray or mop, is used to dissolve false membranes of eroup and diphtheria. Internally, used to assist digestion when gastric acid is deficient. Give after meals; excessive acidity and heartburn are corrected by small doses before meals.

Dose.—Gtt. x. to xxx. = gm. 0.66 to 2.00; highly diluted as above.

ACIDUM NITRICUM, $2\text{HNO}_3 \cdot 3\text{H}_2\text{O}$. M. wt. 180. Nitric Acid.

The pure acid in solution, specific gravity 1.42, and containing 70 per cent. real acid (HNO_3). M. wt. 63.

ACIDUM NITRICUM DILUTUM. Diluted Nitric Acid.

The pure acid in solution, specific gravity 1.068, containing 17.44 per cent. real acid (HNO_3). Three troy ounces nitric acid to water sufficient to make one pint. (U. S. P., specific gravity 1.059 = 10 per cent. HNO_3 .)

Tests.—*Hydrochloric acid*; a white precipitate with solution of silver nitrate added to diluted acid. *Sulphuric acid*; a white precipitate on addition of solution of barium nitrate to the dilute solution. *Mineral matters*; residue on evaporation and ignition.

ACIDUM NITROHYDROCHLORICUM. Nitrohydrochloric or Nitromuriatic Acid.

A mixture of *four parts* nitric, with *fifteen parts* hydrochloric, acid.

ACIDUM NITROHYDROCHLORICUM DILUTUM. Diluted Nitrohydrochloric or Nitromuriatic Acid.

A mixture of nitric acid, *four parts*, and muriatic acid, *fifteen parts*, with distilled water, *seventy-six parts*.

Uses.—Nitric acid is frequently applied to the indolent surfaces of foul and unhealthy ulcers, as in suppurating bubo, soft chancre, etc. Apply with a glass rod or pine stick, protecting the healthy surface with oil. Undue action of the caustic may be controlled by use of alkaline solutions, or by applying subnitrate of bismuth in powder. Gangrenous conditions of the tissues are much benefited by this caustic treatment. Syphilitic warts, mucous patches, and condylomata are removed by moistening frequently with a lotion (one or two per cent. solution of nitric acid). Used internally, highly diluted, in diseases in which some virulent poison seems present. Indicated when the tongue is dark red or violet hued, dry, and covered with a glazed fibrinous coating, in syphilitic and mercurial poisoning, in broken and cachectic constitutions with emaciation, derangement of the nervous system, ulcers of surface, etc.; also in some forms of diarrhœa, as in those of children, when the motions are green, curdled, and mixed with mucus, or are watery, light colored, and alkaline, the tongue presenting the appearance above mentioned.

Nitric and nitromuriatic acids are used in catarrhal conditions of the duodenum and gall-ducts, jaundice, and in chronic hepatic diseases, exciting increased alkaline glandular secretions, and improving the condition of the digestive tract.

Dose.—Of diluted nitric or nitrohydrochloric acid, gtt. ij. to x. = gm. 0.12 to 0.66 in water.

ACIDUM OXALICUM, $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$. M. wt. 126. **Oxalic Acid.**

The acid in transparent, colorless, rhombic, prismatic crystals, of strongly acid reaction and sour taste. In dry, warm air it loses 28 per cent. of its weight (water of crystallization), and forms a soft, white powder of anhydrous oxalic acid.

Solubility.—Soluble in its own weight of boiling and in cold water (8 parts), soluble also in glycerine (7 parts), and alcohol (4 parts).

Tests.—When pure it is entirely dissipated by heating on platinum foil, and is not turned a dark color by heating in a test-tube with strong sulphuric acid.

Antidote.—As a poison, from its resemblance to epsom salt, it has occasioned many deaths. The most effective antidote is calcium carbonate, in form of mixture of powdered chalk and water. Slaked lime may be used when the carbonate is not convenient.

Uses.—It is principally used to remove iron stains from paper, linen, leather, etc. Internally it is not used medicinally, except by the

homœopathic school in triturations, in conditions characterized by numbness and neuralgic pains in the back and legs, or with excessive lassitude and weakness of limbs, all of which are symptoms of the spinal paralysis produced by this remedy. It exerts, also, a local irritant action on the gastro-intestinal mucous membrane.

ACIDUM PHOSPHORICUM DILUTUM. Diluted Phosphoric Acid.

A solution, specific gravity 1.057, of tribasic or orthophosphoric acid (H_3PO_4 . M. wt. 98), containing 10 per cent. of the anhydrous acid. 100 parts saturate 23.40 parts potassium carbonate.

Tests.—*Metaphosphoric acid*; a white precipitate with a solution of albumen. *Sulphuric acid*; a white precipitate with a solution of barium nitrate or chloride. *Hydrochloric acid*; a white precipitate on addition of a few drops of nitric acid and solution of silver nitrate. *Nitric acid*; to a small amount of the dilute acid add two or three small crystals of ferrous sulphate, and then pour gently down the sides of the test glass 10 or 15 drops of strong sulphuric acid, so it will form a layer at the bottom; a dark coloration indicates nitric acid.

Uses.—It is stimulant to the organic and cerebro-spinal nervous systems. Indicated when the tongue is relaxed, sticky and clammy, in states of depression, indifference, debility from loss of fluids or sexual excess, brain-fag and diarrhœa of painless watery stools, containing undigested matters; also, by phosphatic deposits in urine, and in leucorrhœa after too early and long continued menses.

Dose.—Gtt. v. to xx. = gm. 0.33 to 1.33, well diluted.

ACIDUM PICRICUM, $\text{HC}_6\text{H}_2(\text{NO}_2)_3\text{O}$. M. wt. 229.

Picric, or Carbazotic Acid.

The acid in bright-yellow, crystalline needles, melting by heat, and subliming without decomposing. Its taste is acid, and extremely bitter. If rapidly heated to a high temperature, it takes fire and burns, leaving no residue.

Solubility.—Freely soluble in alcohol and ether, and in water (86 parts).

Uses.—It is used extensively as a dye, coloring organic matters a bright, permanent yellow. Owing to its irritant action, the free acid is used internally in attenuated doses only. Carbazotate, or picrate of ammonium, is used where quinia disagrees, in cases of intermittents characterized by hyperæmia of the brain with heavy throbbing pains, especially in the occiput and upper part of the cord.

Dose.—Gr. $\frac{1}{10}$ to $\frac{1}{4}$ = .006 to .016 in pill during the intermission, with intervals of 3 or 4 hours between doses.

ACIDUM SALICYLICUM, $\text{H}_2\text{C}_7\text{H}_4\text{O}_3$. M. wt. 138. **Salicylic Acid.**

The pure acid in light, white, needle-shaped crystals.

Solubility.—Soluble in 480 *parts* cold water, more easily in boiling water; freely soluble in ether, alcohol, and chloroform. The addition of certain salts render it quite soluble in water; as, acid, 1 part, sodium baborate, 1 part, water 100 parts; or, acid, 1 part, sodium phosphate, 1 part, water, 50 parts.

Solutions of potassium citrate or ammonium acetate, also dissolve it.

Tests.—The acid should dissolve in pure, concentrated sulphuric acid, with at most but a faint color. 1 *part* dissolved in alcohol 10 *parts*, and acidulated with a few drops of nitric acid, should not become turbid on adding a solution of silver nitrate. When the alcoholic solution evaporates spontaneously, the residue should be perfectly white.

Uses.—A superior, non-poisonous antiseptic. It prevents putrefactive decomposition and fermentations of all kinds. In lotion made with borax, it is valuable to saturate sponges and dressings used in surgical operations, and as a disinfectant and deodorizer in place of carbolic acid; also in solution in oil (1 or 2 parts to olive-oil 100 parts), or in ointment made with simple cerate or ungt. paraffini, as a dressing to burns, and as an efficient application to some forms of eczema. Used as a gargle or spray (acid salicylic and borax, each 1 part, water, 100 parts) in sore throat of diphtheria, scarlatina, etc. Internally used in conditions in which there is reason to suspect the presence in the organism of some poisonous substance, in a state of decomposition, as in erysipelas, pneumonia, intermittents, pyæmia, surgical fever, diphtheria, scarlatina, and acute rheumatism. For internal use, the sodium salicylate, or salicine, are usually preferred, being less unpleasant in taste, though the acid is more efficient as an antiseptic, and equally so in reducing pain and fever in rheumatic fever. The acrid taste may be disguised by mixing with equal parts of ammoniacal glycyrrhizin, or by use in pill form.

Dose.—Grs. ij. to x. = gm. 0.13 to 0.66, at intervals of one to three hours.

ACIDUM SUCCINICUM, $\text{H}_2\text{C}_4\text{H}_4\text{O}_4$. M. wt. 118. **Succinic Acid.**

The acid in colorless and odorless prismatic crystals when pure, or in brown prisms when prepared from *amber* (a resinous exudate of an

extinct species of *Pinus*). Both varieties are dissipated by high heat, leaving no residue when pure.

Solubility.—Freely soluble in alcohol (15 parts) and water (25 parts); slightly in ether, insoluble in oil of turpentine.

Tests.—Heated on platinum, it is dissipated without residue, and without odor of caramel (burnt sugar). *Tartaric acid*; a white precipitate on adding a solution of a salt of potassium. *Sulphuric acid*; a white precipitate on adding solution of barium nitrate or chloride. *Oxalic acid*; a white precipitate on adding solution of calcium chloride or hydrate. Its combinations with the alkalis are soluble in water, and when neutral produce reddish-brown precipitates with ferric salts.

Uses.—It slightly augments the activity of the circulation and nerve-centres, and increases excretion by skin and kidneys. Not having any well defined medicinal virtue, it is rarely administered.

Dose.—Grs. v. to xv. = gm. 0.33 to 1.00.

An oil, oil of amber, is obtained by the destructive distillation of amber simultaneously with the acid above described. When purified by redistillation from a mixture with six times its volume of water, it is officinal in the U. S. P. under the name of *oleum succini*, or oil of amber. It is a mixture of several oils of the composition $C_{10}H_{16}$, is colorless or yellowish, has a specific gravity from 0.88 to 0.92, and is soluble in alcohol, ether, and oils. It is powerfully irritant, and is sometimes employed in rheumatic and paralytic cases as a constituent of liniments. Internally, in doses of gtt. v. to x., in capsules; it is occasionally used in catarrhal affections of mucous surfaces of the lungs and urinary tract, and as an antispasmodic in painful and convulsive affections.

ACIDUM SULPHURICUM. Sulphuric Acid.

The colorless, concentrated acid; sp. gr. 1.843, and containing 96.8 real acid (H_2SO_4 . M. wt. 98).

ACIDUM SULPHURICUM DILUTUM. Diluted Sulphuric Acid.

Sulphuric acid, 1 *part*, added to distilled water, 9 *parts* (10 per cent. sulphuric acid); sp. gr. 1.081.

Acidum sulphuricum aromaticum, U. S. P., has double the acid strength of the preceding, and contains, also, dissolved, the aromatic constituents of cinnamon and ginger with alcohol. Its specific gravity is 0.955.

Tests.—*Mineral matters*; evaporation and ignition should leave no

residue. *Nitric acid*; a crystal of ferrous sulphate produces a dark coloration. *Lead*; a white precipitate on adding 1 part acid to 4 or 5 times its volume of alcohol. *Arsenic*; a yellow precipitate with sulphuretted hydrogen.

Uses.—On account of its destructive effects it is seldom used as an escharotic. Internally, its use has been mainly for its influence in checking summer and choleraic diarrhœa, and the profuse sweating and diarrhœa of hectic; also, in uterine hemorrhage and in lead-poisoning.

Dose.—Gtt. v. to xx. = gm. 0.33 to 1.33 of the diluted acid in water.

ACIDUM SULPHUROSUM. Sulphurous Acid.

A solution, of sp. gr. 1.035, containing 8.20 per cent. of true sulphurous acid (H_2SO_3 . M. wt. 82), or 6.4 per cent. of sulphurous anhydride (SO_2 . M. wt. 64). [U. S. P. sp. gr. 1.022 to 1.023 = 3.5 per cent. SO_2 .]

Tests.—*Sulphuric acid*; a white precipitate with a solution of barium nitrate or chloride.

Uses.—Used by spray or probang as a local application in numerous affections of the mucous membranes of the mouth and throat, when the tissues look full and lifeless and secretions are fetid. Locally, used as a wash in parasitic skin diseases, gangrenous or ill-conditioned sloughs; also as a disinfectant, and to arrest putrefaction. Its use internally is advantageous when the tissues present the condition described. For local use, a mixture of acid, one part, water, one part, and glycerine, one part; or a mixture of acid and glycerine, each one part; or, if carefully used, the pure acid.

Dose.—Internally, gtt. v. to xx. = gm. 0.33 to 1.33, well diluted.

ACIDUM TANNICUM, $\text{C}_{14}\text{H}_{10}\text{O}_9$. M. wt. 322. Tannic Acid. Tannin.

The greenish-yellow acid in masses or shining scales. It forms insoluble combinations with alkaloids, with most metallic oxides, with ferric salts, and with gelatin, gluten, albumen, and starch.

Solubility.—Soluble in glycerine (6 parts), water (6 parts), and in less than its weight of diluted alcohol; less soluble in alcohol; insoluble in fixed and volatile oils, and slightly soluble in ether.

Tests.—*Resinous substances*; on solution in boiling water the impurities separate on cooling, if present. *Sugar and dextrine*; residue on solution in alcohol. *Mineral matters*; residue on incineration.

Preparations.—A glycerite, $\frac{\text{N}}{5}$, as in Sec. 22, Part I. An ointment, $\frac{\text{N}}{10}$, as follows:

Take of Tannin, <i>one part</i>	1
Ungt. Paraffini, <i>nine parts</i>	9

Mix together.

Uses.—Used locally to restrain excessive secretion from mucous membranes, to contract tissue, and, by lessening the calibre of blood-vessels, to check hemorrhage; also to restrain exhaustive discharges and heal ulcerated surfaces. The benefit from its internal use is mainly due to gallic acid, into which it is converted.

ACIDUM TARTARICUM, $H_2C_4H_4O_6$. M. wt. 150. Tartaric Acid.

The pure acid in colorless crystals or powder.

60 parts saturate 79.98 parts potassium bicarbonate, or 67.20 parts sodium bicarbonate.

Solubility.—Soluble in water (1 part), in alcohol (3 parts), and ether (23 parts).

Tests.—*Copper or lead*; a black precipitate with sulphuretted hydrogen. *Salts of calcium*; a white precipitate with a solution of ammonium oxalate added to a solution of the acid neutralized by ammonia. *Oxalic acid*; a white precipitate from concentrated aqueous solution on addition of solution of calcium sulphate. *Sulphates*; white turbidity with a solution of barium nitrate. The acid should be completely dissipated on heating strongly, and should form a permanently clear solution in 6 parts of alcohol.

Uses.—May be used in conditions of the organism indicating an acid, *i. e.*, deep redness of mucous membranes, with dryness of mouth. It increases alkaline secretions, such as those of the salivary glands, and thus allays thirst. May be used in place of other vegetable acids in fevers, etc. (See *Acetic* and *Citric Acids*.)

Dose.—Grs. x. to xxx. = gm. 0.60 to 2.00 in solution.

ACIDUM VALERIANICUM, $HC_5H_9O_2$. M. wt. 102. Valerianic Acid.

The pure acid as a thin, colorless liquid, specific gravity .940. 1 part of the acid should be neutralized by 2 parts of a solution containing $33\frac{1}{3}$ per cent. of anhydrous potassium carbonate.

Solubility.—Miscible in all proportions with alcohol and ether, and soluble in water (26 parts).

Tests.—*Butyric and acetic acids—alcohol*; the acid dissolves in less than 26 parts of water. *Caproic acid and other less soluble mixtures*; more than 30 parts are required for solution.

Uses.—Used only in combination with bases. (See *Valerianate of Ammonia*, *Valerian*, etc.)

ACONITIA, $C_{33}H_{43}NO_{12}$. M. wt. 645. **Aconitinum**. **Aconitina**.
Aconitine.

The pure alkaloid of *A. napellus* in a white amorphous powder.

Solubility.—Slightly soluble in water (150 parts); freely soluble in alcohol, chloroform, ether, carbon bisulphide, and benzole; insoluble in petroleum benzene.

Tests.—Fuses, and at a high temperature burns with a smoky flame, leaving no residue; reacts alkaline, neutralizes acids from solutions of which it again precipitates by adding caustic alkalies. It is unchanged or becomes brownish-yellow on adding sulphuric acid. It has an acrid, persistent, bitter taste, and is intensely poisonous.

Uses.—Locally used in neuralgia, especially of the fifth pair of nerves, in ointment gr. j. to v. in ʒj of lard or simple ointment, or in solution with alcohol and chloroform, applied with a brush along the course of the affected nerve, avoiding abraded surfaces.

Dose.—When used internally, the commencing dose should not exceed $\frac{1}{250}$ of a grain, repeated two or three times a day, with caution.

Triturations are a convenient form (Sec. 49, Part I.). (See *Aconite*.)

ACONITUM NAPELLUS. Aconite.

The leaves and tuberous roots.

Ranunculaceæ, *Helleboreæ*.

Linné. Bentley and Trimen.

Constituents.—The most important medicinal constituent of aconite is the extremely poisonous alkaloid *aconitia*, *aconitine*, or *aconitina*, which exists in all parts of the plant associated with *aconitic acid* ($H_3C_6H_3O_6$), and *napellina*, a bitter alkaloid. These constituents, as associated in the plant, are soluble in both alcohol and water.

Preparations.—A tincture, $\frac{N}{2}$, from the leaves, as in Sec. 44, Part I.

A tincture, $\frac{N}{2}$, from the root with alcohol, as in Sec. 43, Part I.

A saccharated extract, $\frac{N}{1}$, with alcohol, as in Sec. 21, Part I.

Extract aconite, U. S. P., is made from the root with alcohol.

Tr. aconite, U. S. P., is made with alcohol from the root, and represents in each 100 parts; 40 parts of the root, or 40 per cent. of the weight of the tincture.

Uses.—Used to control inflammation and its accompanying febrile movement. It lessens vascular excitement, subduing excessive rapidity

of the circulation, moistens the skin, and reduces temperature. Febrile diseases of an acute inflammatory character, with temperature elevated, as shown by the thermometer, will be benefited by aconite administered early. The pulse in these cases is frequent, but of a quality indicating resistance to a free circulation, which condition is relieved by it.

Dose.—Add of the tincture aconite rad., $\frac{N}{2}$, gtt. v. to x. to water $\bar{3}$ iv; mix, and give a teaspoonful every hour until pulse is normal in frequency. The maximum dose may be stated thus: Of the root or herb in powder, grs. j. to ij. = gm. 0.06 to 0.13, or an equivalent quantity of the preparations named above.

The strong liquid preparations are used locally for the relief of neuralgiæ, applied over the course of the affected nerves, avoiding cuts or abrasions of the skin.

ACORUS CALAMUS. Calamus.

The recent rhizome.

Araceæ, Acoroidæ.

Linné.

Constituents.—*Volatile oil*, a bitter principle *acorin*, soluble in alcohol and ether, faintly alkaline, and comporting itself with reagents like an alkaloid, *resin*, *gum*, *starch*, and *cellulose* are present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used to relieve colic, and as a vascular stimulant in typhoid conditions.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent.

ACTÆA SPICATA. Baneberry.

The recent rhizome and rootlets.

Ranunculaceæ.

Linné.

The above is a European plant, bearing a berry of a black color. *A. rubra* and *A. alba* are two varieties of the same species, indigenous to this country; the first bearing red, and the second white, berries, and having on this account the common names of red and white baneberry, or cohosh. These distinctions are not sufficient, however, as the color of the berry varies considerably in the last, *A. alba*.

Preparations.—A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 45, Part I.

Uses.—These are not well defined. Belonging to the same family as cimicifuga, all these varieties probably possess similar virtues. The *A. alba* has been recommended for after pains, administered in hot infusion.

Dose.—The tincture, $\frac{N}{2}$, may be used in doses ranging from gtt. ij. to xv. = gm. 0.13 to 1.00.

ADANSONIA DIGITATA. Baobab.

The bark.

Sterculiaceæ, Bombacææ.

Linné.

Uses.—A tropical African tree. One of the many supposed substitutes for cinchona in curing intermittents. Virtue not demonstrated.

ADEPS. Prepared Lard.

The internal fat from the abdomen of the hog. The perfectly fresh omentum washed, melted, strained, and kept warm at the temperature of a water-bath, until free from water.

A mixture of oleine and stearine, of a semi-solid consistence below 90° F. Specific gravity 0.938.

Tests.—*Chloride of sodium*; a white precipitate with argentic nitrate from water which has been shaken with the melted fat. *Starch*; blue color, with same on addition of tr. iodine. *Lime*; a white precipitate from same acidulated with hydrochloric acid on addition of ammonium oxalate. *Rancidity*; odor.

Uses.—Used by inunction in chronic, wasting diseases, scaly skin-diseases and to diminish restlessness from heat of skin in eruptive and other fevers; to diminish susceptibility to frequent catarrhal attacks, and to promote constructive metamorphosis in nutritive derangements.

ADEPS BENZOINATUS. Benzoinated Lard.

Prepared lard, heated in a water-bath with gum benzoin, 10 grains to the ounce, or with tincture benzoin, $\frac{N}{3}$, 10 parts to 90 parts of lard, avoiding in the process a temperature exceeding 60° C. (140° F.).

Tests.—See *Adeps*.

Uses.—Used as a basis for ointments which are less likely to become rancid than when lard only is used.

ADIANTUM PEDATUM. Maidenhair.

The fresh plant.

Filices.

Linné.

Preparations.—An infusion, $\frac{N}{10}$, as in Sec. 23, b, Part I.

A syrup as follows:

Take of Infusion of Maidenhair, $\frac{N}{10}$, forty parts	.	.	.	.	40
Sugar, sixty parts	.	.	.	.	60

Dissolve the sugar in the infusion.

Uses.—Used in pulmonary catarrhs. A feeble remedy.

Dose.— ʒj. to ʒij. = gm. 4.00 to 8.00 of the syrup or equivalent.

ADONIS VERNALIS.

The recent plant.

Ranunculaceæ.

Linné.

Constituents.—It has not been thoroughly examined. *Adonidin*, a bitter, amorphous glucoside, has been determined as one of its constituents, and it is said by some authorities to contain *aconitic acid*.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Some European experiments indicate its value in compensatory troubles of the heart's action. Its effects are said to be similar to those produced by *digitalis*, but that it is safer when administered continuously for a long time.

Dose.—Used in the same manner and dose as *digitalis*.

ÆSCULUS GLABRA. Ohio Buckeye.

The recent bark.

The recent seeds, fully ripe.

Sapindaceæ.

Gray.

Constituents.—No thorough analysis of this drug is recorded. *A. pavia* (red buckeye) contains resin, tannin, a tasteless crystalline principle, a fixed oil, and an acrid glucoside differing from that of *A. hippo*; as its poisonous action is similar to that of *A. glabra*, the latter has probably an analogous composition.

Preparations.—From both bark and seed.

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A trituration from the recent seeds with their integuments removed, as in Sec. 49, Part I.

Uses.—This remedy, which is far more powerful than *A. hippo*, is used in similar conditions, but in smaller doses. It exerts a decided influence on the nervous system, and is recommended in cerebro-spinal meningitis (in trituration, $\frac{N}{103}$ to $\frac{N}{106}$), and in paralysis, tincture, $\frac{N}{1}$, gtt. i. to x. to water ʒiv. Teaspoonful every one to four hours. Being a powerful remedy, it should be used with caution, but is worthy of study.

ÆSCULUS HIPPOCASTANUM. Horse-chestnut.

The recent bark.

The recent seed, fully ripe.

Sapindaceæ, Hippocastanæ.

Linné.

Constituents.—The bark contains *tannin*, two principles, *aesculin* ($C_{15}H_{16}O_9$), and *fraxin* ($C_{32}H_{36}O_{20}$), soluble in alcohol, and exhibiting blue fluorescence in alkaline, aqueous solution. The seeds contain *fixed oil*, *aesculin*, two acrid bodies *argyræscin*, a glucoside, and *aphrodæscin*, both soluble in water; other principles of no medicinal value are present.

Preparations.—From both bark and seed.

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—The bark possesses feeble, anti-periodic powers, and may be used to supplement quinine to prevent the return of the paroxysm in periodic fevers. The seeds especially influence the colon, rectum, and pelvic viscera, antagonizing congestion thereof, and thus relieving hemorrhoids, constipation, with hard, dry, light-colored stools, and the painful and unpleasant reflex symptoms due to the presence of these disorders. Useful also in active congestion of the pelvic contents.

Dose.—Tincture, $\frac{N}{1}$, of bark, gtt. i. to iij. = gm. 0.06 to 0.20, or equivalent.

Tincture, $\frac{N}{2}$, of seeds, gtt. i. to xv. = gm. 0.06 to 1.00, or equivalent to water $\bar{3}$ iv. (gm. 128.00). Teaspoonful (gm. 4.00) of mixture.

ÆTHER. Ethylic Ether.

A colorless, highly inflammable, and volatile neutral liquid, containing 74 per cent. of ethyl oxide (C_2H_5)₂O. M. wt. 74, and 26 per cent. of water, and of specific gravity 0.750 at 15° C. (59° F.).

ÆTHER FORTIOR. Stronger Ether.

Specific gravity 0.725 at 15° C. (59° F.), and containing 94 per cent. ethyl oxide (C_2H_5)₂O.

Solubility.—Miscible in all proportions with chloroform, alcohol, bisulphide of carbon, and benzol. Soluble in water to extent of 10 per cent.

Tests.—*Alcohol or water*; specific gravity increased. *Acids*; evaporate a small portion of ether until but a few drops remain, and test with blue, neutral litmus paper; pure ether should evaporate, leaving only a slight deposit of moisture, without taste or odor.

Uses.—As a powerful, diffusive stimulant in syncope; hysterical paroxysms; headaches where the face is pale, skin and extremities cool, pulse feeble; in gastralgia, and to expel flatus. Usually administered in the form of Hoffman's anodyne (spirits æther comp., U. S. P.), a

mixture of strong ether, 30 *parts*, alcohol, 67 *parts*, and ethereal oil, 3 *parts*. (Dose, mx . to xxx ., repeated every 15 minutes to one hour, as its effects are transient.)

Dose.—Gtt. v. to xx. = gm. 0.33 to 1.33. Used by inhalation in surgical operations of magnitude, or by spray to produce anæsthesia in minor operations. It is considered safer than chloroform, although the stage of excitement is longer.

ÆTHER ACETICUS, $\text{C}_2\text{H}_5\text{C}_2\text{H}_3\text{O}_2$. M. wt. 88. **Acetic Ether.**

The pure ether as a limpid, volatile liquid, of an agreeable fruity odor and taste. Specific gravity 0.900 to 0.904 at 15°C .; boiling at 74°C . (165.2°F .), and highly inflammable.

Solubility.—Mixes in all proportions with alcohol, ether, chloroform, carbon bisulphide, and benzol. It dissolves in water (11 or 12 parts), in contact with which, upon exposure to air, acetic acid is formed.

Tests.—*Alcohol*; decrease in bulk of $\frac{1}{8}$ to $\frac{1}{10}$ when the ether is mixed with an equal bulk of water. When mixed with glycerine instead of water, the volume is unaltered. Should be neutral to test paper, and volatile without residue.

Uses.—Used as an agreeable, pungent stimulant and antispasmodic in syncope and nervousness, colic and flatulence. Bronchial and laryngeal irritation are benefited by inhaling its vapor. It is used as a solvent for many oils, volatile and fixed, resin, cantharidin, and other organic compounds.

Dose.—Gtt. xv. to xxx = gm. 1.00 to 2.00 or more, diluted.

ÆTHER FORMICUS, $\text{C}_2\text{H}_5\text{CHO}_2$. M. wt. 74. **Formic Ether.**

The pure ether as a colorless, inflammable liquid, of an agreeable odor and pungent taste. Specific gravity .9184.

Solubility.—Soluble in ether, alcohol, fixed and volatile oils, and in water (9 parts).

Uses.—Has not been used remedially. Hypodermically upon animals, it lowers the temperature, lessens, but does not abolish, sensibility, and induces somnolence with muscular relaxation. The urine contains formic acid after its use.

ÆTHER HYDRIODICUS, $\text{C}_2\text{H}_5\text{I}$. M. wt. 156.

Ethyl Iodide. Hydriodic Ether.

The pure ether as a colorless, neutral, non-inflammable liquid. Specific gravity 1.946; boils at 158°F . Has a penetrating odor, and

decomposes by exposure to light. Keep in the dark in well-filled vials.

Solubility.—Slightly soluble in water; freely in alcohol and ether.

Uses.—By inhalation, in doses of 10 to 15 drops (gm. 0.66 to 1.00), to induce the constitutional and local influence of iodine in phthisis, bronchitis, etc. When the ether becomes discolored from separation of iodine, it may be purified by rectification, or by shaking with mercury.

ÆTHER HYDROBROMICUS, C_2H_5Br . M. wt. 109.

Ethyl Bromide. Hydrobromic Ether.

The pure ether as a colorless, volatile liquid; inflammable with difficulty; sp. gr. 1.47 at 60° F.; boils at 105.2° F.; odor, ethereal; taste, sweet and rather warm.

Solubility.—Sparingly soluble in water, freely in alcohol and ether.

Uses.—As an anæsthetic, which is said to be superior to chloroform in that it acts more speedily and does not affect the brain to the same degree; nor is it so likely to produce sickness of the stomach. Administer like chloroform, with same precautions.

Has been used principally in brief operations, and should be considered as an anæsthetic as yet not thoroughly understood, and hence to be used with great caution.

Dose.—From a few drops to half an ounce by inhalation.

ÆTHER METHYLICUS, $(CH_3)_2O$. M. wt. 46.

Methyl Oxide. Methyl Ether.

The pure ether as a colorless gas, highly inflammable, having an ethereal odor and pleasant taste.

Solubility.—Soluble in water, alcohol, ether, and wood-spirit.

Uses.—Recommended by Dr. B. W. Richardson in form of saturated solution (at 32° F.) in ether, under the name of methylethyl ether, as a safe anæsthetic, producing no preliminary spasm of larynx, change of color, or other unpleasant symptom. On account of its being of less pleasant odor than other anæsthetics it has not been generally used.

ÆTHYLENI BICHLORIDUM, $C_2H_4Cl_2$. M. wt. 99.

Ethylene, or Ethene Chloride. Bichloride of Ethylene.

A colorless, inflammable liquid; sp. gr. 1.270; boils at 185° F.; has a sweetish taste and an odor resembling chloroform.

Solubility.—Nearly insoluble in water; soluble in alcohol and ether.

Uses.—One of the numerous substances proposed as an anæsthetic. It is rapid in its action, free from the unpleasant symptoms present when chloroform is used, such as excitement, pallor, etc., but has the serious objection of irritating the throat to a degree that limits its usefulness.

Dose.—By inhalation, \mathfrak{zj} . to $\mathfrak{z}\mathfrak{j}$. = gm. 4 to 30. Locally, in spray, in neuralgiæ and other local painful conditions.

AGARICUS ALBUS. White Agaric.

The dried fungus in irregular or hoof-shaped white pieces, spongy, but friable; taste, somewhat acrid and very bitter. *Polyporus officinalis* and *Boletus laricis* are names under which it is known.

Fungi.

Fries. Linné.

Constituents.—*Fumaric* (boletic acid of Bley) acid; *citric* and *malic* acids; *agaric* acid; *laricin* ($C_{14}H_{48}O_2$); *two resins*, insoluble in cold alcohol; *a resin*, soluble in cold alcohol, chloroform, and glacial acetic acid, and of an intensely bitter taste. The constituents soluble in alcohol represent those medicinally valuable.

Preparations.—A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Agaric is purgative in large doses (\mathfrak{zj} . to ij . = gm. 4.00 to 8.00), but is seldom prescribed for this purpose. In medicinal doses it is said to restrain the excessive sweating, bronchial secretion, and diarrhœa often present in phthisis. May be used in substance, or in equivalent amounts of the tincture, in doses given below, and repeated hourly if required. In obstinate periodical fevers, when the chill is very brief and the fever seems nearly continuous, and is followed by little or no sweat, when there is derangement of the abdominal viscera, especially the liver, as shown by jaundiced condition of skin, aching pains of back and joints, etc., this remedy will prove valuable in small doses.

The *Polyporus pinicola* possesses similar properties.

Dose.—Tincture, $\frac{N}{2}$, gtt. x. to xx. = gm. 0.66 to 1.33; in water, $\mathfrak{z}iv$. = gm. 128.00. Teaspoonful doses (gm. 4.00).

AGAVE AMERICANA. Century Plant.

The fresh leaves and root.

Amaryllidaceæ.

Linné.

Constituents.—The fresh leaves contain an acidulous and acrid *juice*, which contains *sugar*, *gum*, and *malate of calcium*. The fermented juice produces a vinous, acidulous beverage, called in Mexico, pulque.

Preparations.—A tincture, $\frac{N}{2}$, with alcohol, from the root, as in Sec. 44, Part I.

A tincture, $\frac{N}{2}$, with alcohol, from the leaves, as in Sec. 44, Part I.

Uses.—The fresh juice is laxative and diuretic. The juice, obtained from the leaves by cooking in hot ashes and expressing, is recommended in the treatment of scurvy, in amounts of two or three ounces daily. The root is considered alterative.

Dose.—Tincture, $\frac{N}{2}$, gtt. i. to xv. = gm. 0.06 to 1.00.

AGAVE VIRGINICA. False Aloe.

The fresh root.

Amaryllidaceæ.

Linné.

Constituents.—Not known.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—The root of this plant, which is very bitter, is used in tincture for colic and as an antidote to the rattlesnake bite. One of the common names of the plant is rattlesnake's master. The drug should be investigated.

Dose.—Tincture, $\frac{N}{1}$, gtt. i. to x. = gm. 0.06 to 0.66, or equivalent.

AGRIMONIA EUPATORIA. Agrimony.

The fresh leaves, and tops.

Rosaceæ, Roseæ.

Linné.

Constituents.—There has been no accurate analysis. *Tannin* (about five per cent.) is one constituent that has been determined.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—To restrain excessive secretion and improve the tone of mucus membranes in bronchorrhœa, chronic catarrh of the bladder and vagina, passive hemorrhages and mucous fluxes of the bowels, and as a constituent of astringent gargles for sore throats.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to 3j. = gm. 0.06 to 4.00, or equivalent.

AILANTHUS GLANDULOSA. Tree of Heaven.

The fresh bark of the root and small bushy sprouts.

Simarubaceæ.

Desf.

Constituents.—*Tannin, volatile oil, soft resin, and a bitter principle,*

all soluble in alcohol. The inert constituents found in most plants, as *starch*, *gum*, etc., are also present with inorganic salts.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 45, Part I.

Uses.—In small doses it stimulates, and in large doses depresses the function of the cerebro-spinal axis and of the pneumogastric nerve. Respiration and the heart's action are both slowed (after temporary stimulation), and after large doses, or if pushed too far, great prostration ensues. It has been successfully used in cardiac palpitation, obstinate hiccough, asthma, and epilepsy, in the cough and pulmonary oppression present with eruptive fevers, as in measles, scarlatina, etc. The influence on the lower portion of the cord has been utilized in the treatment of dysentery and enteritis.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to 3j. = gm. 0.32 to 4.00, or equivalent to water 3iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

AKAZGA. West African Ordeal Poison.

Boundou, ikaja, quai, are names applied by the natives of equatorial Africa to the bark of the root of the above plant, and which they use in decoction as an ordeal poison. The plant is closely allied to the *Strychnos nux vomica*, probably a hitherto unknown species, though some authorities assign it to the family *Apocynaceæ*.

Constituents.—An alkaloid, *akazgia*, with a strong general resemblance to strychnia, but less intensely bitter in taste; insoluble in water, soluble in alcohol, ether, chloroform, and carbon bisulphide; reaction alkaline, and dissolving in dilute acids forming colorless salts.

Its color reactions with sulphuric acid and bichromate of potash are said to be identical with those of strychnia.

Uses.—Internally, it exaggerates sensibility, which condition is followed by tetanic convulsions, and at last paralysis, and death if the dose is sufficiently large. It has not been used therapeutically.

ALCOHOL. Alcohol. Spiritus Rectificatus. Ethyl Alcohol. Ethyl Hydrate.

A colorless, neutral liquid, specific gravity 0.820 at 15.6° C. (69° F.), or 0.812 at 25° C. (77° F.), and containing 94 *parts* by measure, 91 *parts* by weight of ethyl alcohol, or ethyl hydrate (C_2H_5HO), in 100 *parts*.

Tests.—*Resinous and oily matters*; opalescence or precipitation on dilution with water. *Fusel oil and aldehyd*; mix half a fluidounce

of alcohol to be tested, with same amount of ether, and one fluidounce of water; shake well, and permit the ether to separate; decant it, and evaporate it at a low temperature; the impurities may be recognized by odor of residue.

Uses.—Alcoholic stimuli, principally in the form of wine, whiskey, and brandy, are used internally in conditions of prostration or exhaustion, when the skin is cool, the pulse soft, feeble, and compressible; or in conditions of languor, low delirium, or great loss of strength. It should be given in small amounts, repeated only as the stimulant effect of each dose disappears.

For its application as a solvent, see Part I.

ALCOHOL AMYLICUM, $C_5H_{11}HO$. M. wt. 88.

Fusel Oil. Amylic Alcohol. Amyl Hydrate.

The pure alcohol as a colorless, oily liquid, with an offensive penetrating odor, specific gravity 0.818, and boiling-point $269.6^{\circ} F$. It takes fire with difficulty, does not permanently stain paper, and evaporates on heating, leaving no residue. It is a solvent for sulphur, iodine, phosphorus, camphor, resins, and alkaloids.

Solubility.—Soluble in water (40 parts), and in all proportions in alcohol, ether, chloroform, bisulphide of carbon, and in volatile and fatty oils.

Uses.—For the artificial preparation of valerianic acid, amyl nitrite, fruit odors, and as a solvent. Internally, it is occasionally used as a direct nervous stimulant in chronic alcoholism.

Dose.—Two or three drops = gm. 0.13 to 0.20.

ALCOHOL DILUTUM. Diluted Alcohol.

A mixture of ethyl alcohol, specific gravity .820, and water in proportion of equal parts by weight, and having the specific gravity 0.918 at $15.6^{\circ} C$. ($60^{\circ} F$.) and 0.920 at $25^{\circ} C$. ($77^{\circ} F$.).

To reduce alcohol of any higher strength to diluted alcohol.

Divide the alcoholic percentage by 45.5 and subtract 1 from the quotient. This gives the number of parts of water to be added to 1 part of the alcohol to be reduced. (U. S. P.).

Tests.—**Uses.**—See *Alcohol*, *supra*.

ALCOHOL METHYLICUM, CH_3HO . M. wt. 32. Methyl

Alcohol. Wood Spirit. Methyl Hydrate.

The pure spirit, as a colorless liquid, inflammable, of a peculiar odor and warm taste, specific gravity ($0^{\circ} C$) .814, boiling at $149^{\circ} F$. It is

a solvent of resins, volatile oils, and fats. Distinguished from acetone by dissolving calcium chloride.

Solubility.—Soluble in alcohol, water, and ether.

Uses.—Added in proportion of ten per cent. to ordinary alcohol, it constitutes methylated spirit of commerce used for manufacturing processes, but unfit for internal use. Wood spirit is not now used medicinally.

ALDEHYD, C_2H_4O . M. wt. 44. Aldehyd. Acetic Aldehyd.

A neutral, colorless, inflammable liquid of peculiar, suffocating odor, specific gravity ($0^\circ C.$) .805; boils at $20.8^\circ C.$ ($69.8^\circ F.$), and in contact with air is converted into acetic acid.

Solubility.—Soluble in water, alcohol, and ether.

Uses.—An anæsthetic of great power when administered by inhalation. It abolishes both sensibility and motion very promptly, but on account of its property of arresting respiration and irritating the lungs and stomach, it is unfitted for use on man. Its presence in small amount in a liquid (3 to 5 per cent.) prevents putrefaction.

ALETRIS FARINOSA. Stargrass.

The recent root.

Hæmodoraceæ.

Linné.

Constituents.—A *bitter principle*, freely soluble in alcohol, less so in water. Owing to the confusion heretofore existing between this plant and the Helonias (*Chamælririum*), it has not been carefully examined.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol as in Sec. 20, Part I.

Uses.—As a gastric stimulant to improve digestion.

Dose.—Grs. j. to x. = gm. 0.13 to 0.66, or equivalent.

ALISMA PLANTAGO. Water Plantain.

The fresh leaves and root, equal parts.

Alismaceæ.

Linné.

Constituents.—A pungent *volatile oil* and an acrid *resin*.

Preparations.—From a mixture of equal parts of leaves and root, finely minced, pounded to a pulp, prepare a tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Not well defined, but worthy of investigation. It has been

used in dysenteries, diarrhœas, in calculous renal affections, epilepsy and chorea, and locally, to recent bruises, swellings, and sores. These uses may suggest the line of inquiry as to its real value.

Dose.—Tincture, $\frac{N}{2}$, gtt. i. to xv. = gm. 0.06 to 1.00.

ALKANNA. Alkanet Root.

The root of *Alkanna* (*anchusa*) *tinctoria*.

Boraginaceæ.

Linné.

Constituents.—Red coloring matter, called *anchusin*, *alkannin*, or *anchusic acid*, soluble in alcohol, ether, volatile oils and fats; insoluble in water; alkalies turn it to a blue color. Evaporation of the tincture causes the acid to change to alkanet green; soluble in ether. Other constituents unimportant.

Uses.—As a harmless coloring matter for oils, pomades, etc.

ALKEGENGI. Winter Cherry.

The fruit of *Physalis alkekengi*.

Solanaceæ.

Constituents.—A bitter principle, *physalin* ($C_{14}H_{16}O_5$), soluble in alcohol and chloroform, slightly in water, ether, and dilute acids, is found in the leaves. *Citric acid* and *sugar* in the berries.

Uses.—The juice of the berries, two or three fluidounces per day, or of an infusion, $\frac{N}{16}$ (Sec. 23, *b*, Part I.), of the dried berries, ad libitum, is used in dropsical conditions, jaundice, retention of urine, and irritable bladder.

ALLIUM SATIVUM. Garlic.

The bulb.

Liliaceæ.

Linné.

Constituents.—The active constituent is a heavy, yellow, acrid, very fetid, *volatile oil*, which is a mixture of sulphide $(C_3H_5)_2S$, and oxide (C_3H_5O) of the compound radical allyl. This oil is heavier than water, which dissolves it sparingly, and is soluble in alcohol, ether, and acetic acid. The other constituents are unimportant.

Uses.—Locally, the juice or the bulb prepared as a poultice, as a stimulant in atonic conditions of a part, and internally as a general stimulant. The juice may be dropped in the ear in atonic deafness. The bulb may be prepared as a poultice and applied over the pubes in atony of the bladder, or used similarly over the chest in chronic bronchitis in children. Its internal use is frequently of advantage in anasarca as a diuretic.

Dose.—Of the juice or chopped bulb, 15 to 30 grains = gm. 1.00 to 2.00.

The common onion (*Allium cepa*) possesses similar properties.

ALNUS SERRULATA. Red or Tag Alder.

The fresh bark. (*A. rubra*.)

Betulaceæ.

Aiton. Gray.

Constituents.—An *astringent principle*, a small amount of *resinous* and *oily* matter; all soluble in alcohol.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

A dried extract, $\frac{4N}{I}$, with alcohol, as in Sec. 20, Part I.

Uses.—For its direct influence on the skin and mucous membranes through its stimulation of nutritive processes; in chronic eruptive diseases, as eczema, prurigo, herpes, impetigo, etc.; also, in ulcerated or inflammatory conditions of the mucous membranes of mouth and throat. Indigestion from imperfect secretion of gastric juice is much benefited by this remedy.

Dose.—Tincture, $\frac{N}{I}$, gtt i. to xx. = gm. 0.06 to 1.33 or equivalent.

ALOE SOCOTRINA. Socotrine Aloes.

The inspissated juice of the plant, free from matters insoluble in alcohol. (*Aloe purificata*, U. S. P.)

Liliaceæ.

Lamarck.

Constituents.—*Volatile oil*, *resin*, and *aloin* or *socaloin* ($C_{16}H_{18}O_7$), all of which dissolve in alcohol; the last only is soluble in water.

Preparations.—A tincture, $\frac{N}{3}$, with alcohol, as in Sec. 48, Part I.

Tr. aloes (U. S. P.) contains aloes, *ten parts*, extract licorice, *ten parts*, to diluted alcohol sufficient to make *one hundred parts*.

Uses.—Used as a direct stimulant to the muscular portion of the large intestine, and to the rectum. Its purgative principle diffuses rapidly into the blood, producing its effects by impressing the centres presiding over the pelvic viscera, and not by a local reflex influence through contact with the mucous membranes of the intestinal canal. It is most useful in torpor and relaxation of muscular elements of parts influenced, and disease produced by it, such as constipation from weakness, melancholia, or hypochondria, etc. In hemorrhoids from portal congestion, profuse menstruation in females of relaxed fibre, copious, watery diarrhœa from weakness, minute doses will be found beneficial.

Large doses exhaust the contractility of the muscular elements of the pelvic tissues and induce all the abnormal conditions above referred to when too long continued. Occasionally useful to cause determination of blood to the pelvis in amenorrhœa.

Dose.—Grs. j. to ij. = gm. 0.06 to 0.13; or when minute dose is indicated, Tincture, $\frac{x}{5}$, gtt. v. to x. = gm. 0.33 to 0.66 to water, $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses, gm. 4.00.

ALSTONIA SCHOLARIS. Dita Bark.

The bark of above, a forest tree of the Philippine and neighboring islands.

Apocynaceæ.

Robert Brown. Bentley and Trimen.

Constituents.—What seem the most reliable analyses indicate the presence of an alkaloid, *ditamina*, white, somewhat bitter, soluble in alcohol, chloroform, ether, and benzol, and in acids forming salts which are very bitter; two *organic acids*, one crystalline and one oily; *five resinous bodies*, some of which are crystalline; a *second alkaloid*, soluble in water and alkalies, but not in ether; other unimportant constituents. Alcohol dissolves all the active ones.

Preparations.—A tincture, $\frac{x}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{x}{2}$, with alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

Alstonia constricta (Australian fever tree. F. von Mueller), of the same natural order, a native of Australia, has been introduced as a substitute for quinia in intermittents. Its constituents are a crystalline alkaloid, *alstonina*, and an unnamed amorphous alkaloid.

Like *A. scholaris*, it yields its virtues to alcohol, and the same class of preparations may be made from it. It is claimed that it is stronger than *A. scholaris*.

Uses.—As a substitute for quinia in intermittents. As with all such substitutes, the indications for their selection are not well defined, as they are usually given, simply “because quinia has failed.” As there is much favorable testimony regarding both these remedies, they deserve attention.

Dose.—Grs. ij. to viii. = gm. 0.13 to 0.53 every hour or two, beginning several hours prior to the expected chill.

Equivalent amounts of the preparations may be used, and are more convenient.

ALTHÆA OFFICINALIS. Marsh-Mallow.

The dried root deprived of its bark and discolored portions by peeling; should be white in color, of a faint, peculiar odor and mucilaginous taste.

Malvaceæ.

Linné. Bentley and Trimen.

Constituents.—*Starch, mucilage, pectin, oil, glutinous matter, cellulose, calcium phosphate, and asparagin* ($C_4H_8N_2O_3 \cdot H_2O$). (Syr. Althææ, U. S. P. = $\frac{N}{25}$.)

Uses.—This plant, in common with nearly the entire order Malvaceæ, possesses demulcent properties. Its use is quite common in poultices, as a protective to local inflammations of the skin, and in decoction, in irritable conditions of mucous membranes of throat, stomach, intestines, and even of trachea, bronchi, and urinary organs. The property of influencing distant organs, if it exists, probably depends on the asparagin.

Dose.—In decoction, $\frac{N}{10}$, as in Sec. 18, Part I., used *ad lib.*

ALUMINII ET AMMONII SULPHAS, $Al_2(SO_4)_3(NH_4)_2SO_4 \cdot 24H_2O$.
M. wt. 907. Ammonium Alum.

The salt, each 100 *parts* of which contains 14.58 parts of ammonium sulphate, 37.83 parts of aluminium sulphate, and 47.59 parts of water.

ALUMINII ET POTASSII SULPHAS, $Al_2(SO_4)_3K_2SO_4 \cdot 24H_2O$.
M. wt. 949. Potassium Alum. Alumen, U. S. P.

The salt, each 100 *parts* of which contains 18.39 parts of potassium sulphate, 36.14 parts of aluminium sulphate, and 45.47 parts of water.

ALUMINII SULPHAS, $Al_2(SO_4)_3 \cdot 18H_2O$. M. wt. 667.
Aluminium Sulphate. Crystallized.

The salt, each 100 *parts* of which contains 51.4 parts aluminium sulphate, 48.6 parts of water.

Tests.—*Iron*; purple coloration on adding a solution of tannin.

ALUMEN EXSICCATUM. Dried Alum.

Potassium, or ammonium alum, deprived of water of crystallization by heat not exceeding $400^\circ F$.

Alum of commerce is a mixture of potassium and ammonium alums. [Dried alum, U. S. P., is made from potassa alum.]

Solubility.—Alum is soluble in its own weight of boiling water, in

cold water (15 parts), and in glycerine (40 parts); insoluble in alcohol, ether, and chloroform.

Aluminium sulphate is soluble in twice its weight of cold water. Dried alum is insoluble, but after long contact takes up water of crystallization and slowly dissolves.

Uses.—Alum is principally used as a topical astringent to the skin or mucous membranes, combining with the albumen of the part, or its secretions, condensing the tissue and reducing the calibre of capillaries, thus restraining excessive discharge or hemorrhage. Dried alum is a mild escharotic or stimulant to indolent ulcers, and deodorizer to remove fœtor and lessen discharges.

A superior, non-poisonous antiseptic may be prepared as follows:

• Take of Alum, <i>seventy-two parts</i>	:	.	.	.	.	.	.	.	72
Sugar of lead, <i>one hundred and fifteen parts</i>	.	.	.	.	.	.	.	.	115
Water, <i>sufficient</i>	.	.	.	.	.	.	.	.	q. s.

Dissolve the alum and sugar of lead each in 500 parts of water, mix the solutions, filter, and add water through the filter sufficient to make *one thousand (1000) parts*. This forms a 3 per cent. solution of aluminium acetate, which may be diluted with 3 to 6 times its volume of water, and used for irrigation in ozœna, vulvitis, etc.

Internally, alum is employed as an emetic in true croup (3j. every fifteen minutes, in honey or syrup, until vomiting occurs); to control passive hemorrhages of the gastro-intestinal tract, uterus, and bladder; to diminish the urinary discharge in polyuria, and the excessive secretion of ropy mucus in whooping-cough. The constipation of lead colic, in which disease the intestine is spasmodically contracted, is said to be overcome by the use of alum in solution slightly acidulated with sulphuric acid, given in amounts representing 3j. to 3iij. = gm. 4.00 to 12.00, daily.

Dose.—Grs. ij. to xxx. = gm. 0.13 to 2.00, with some aromatic to prevent nausea.

AMBRA GRISEA. Ambergris.

An excretion, or perhaps a morbid secretion, of the sperm whale, *Physeter macrocephalus* (Linné), of a gray or grayish-brown color, waxy appearance, peculiar musk-like odor, lighter than water, and fusible at or below 98° F.

Solubility.—Soluble in ether, hot alcohol, and volatile oils; miscible with fats.

Constituents.—About 85 per cent. of a non-saponifiable fat-like substance, called *ambrein*, which is white, tasteless, and inodorous when

crystallized from hot alcohol, *chloride of sodium*, *benzoic acid* (?), and *balsamic matters*.

Preparations.—A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 47, Part I.

Triturations, as in Sec. 49, Part I.

Uses.—A tincture, of above strength, is used in perfumery for fixing very delicate odors. Internally, as a remedy for nervous and hysterical diseases, with various unpleasant symptoms affecting the female genitalia and associated organs. Used mainly by homœopathic practitioners, who employ it in tincture of same strength and in triturations. It was formerly used in doses of 5 to 20 grains = gm. 0.33 to 1.33, in substance, for spasmodic conditions of hysterical origin.

AMBROSIA ARTEMISIÆFOLIA. Ragweed.

The fresh leaves of the above species, variously known as Roman wormwood, hogweed, bitterweed, and ragweed. Allied species of the same genus seem to possess similar properties.

Compositæ, Senecionidææ.

Gray.

Constituents.—Not determined.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—In intermittents, to palliate mucous fluxes and hemorrhages; and locally, the expressed juice in poisoning from *Rhus. tox.* A drug little used, but worth a thorough study.

Dose.—Tincture, $\frac{N}{1}$, gtt. ij. to xx. = gm. 0.13 to 1.33, or equivalent.

AMMONIACUM. Ammoniac.

The best quality of the gum resin in "tears," obtained from *Dorema ammoniacum*. Don.

Umbelliferæ, Orthospermæ.

Bentley and Trimen.

Constituents.—Medicinal; *resin* and *volatile oil*, both soluble in alcohol and partially in ether. Non-medicinal; *gum*, *extractive*, *glutenous matter*, insoluble in alcohol, partly so in water.

Tests.—Sand, chips, etc., though rarely in the "tear" form, when present, may be removed by melting in water and straining.

Uses.—Principally as a topical stimulant in form of plaster to glandular swellings and indolent enlargements of the joints. Occasionally used internally in trituration, or suspended in water in chronic bronchial affections with profuse expectoration.

Dose.—Grs. v. to xxx. = gm. 0.33 to 2.00.

AMMONII BENZOAS, $\text{NH}_4\text{C}_7\text{H}_5\text{O}_2$. M. wt. 139.**Benzoate of Ammonium.**

The pure salt in colorless, shining, tabular crystals.

Solubility.—Soluble in alcohol (28 parts), water (5 parts), and glycerine.

Tests.—*Fixed impurities*; residue on heating on foil. *Oxalate of ammonium*; a white precipitate when lime water is added to its solution.

Uses.—Administered when the urine is ammoniacal, inducing cystitis or incontineee, or when, for the same reason, it is loaded with phosphates, or phosphatic calculi are present. It renders the urine acid, arrests fermentation, and promotes the solution of renal and cystic deposits.

Dose.—Grs. x. to xxx. = gm. 0.66 to 2.00.

AMMONII BORAS, $2(\text{NH}_4\text{H}_2\text{BO}_2) \cdot 3\text{H}_2\text{O}$. M. wt. 264.**Borate of Ammonium.**

The pure salt in transparent, octahedral crystals, of strong ammoniacal odor.

Solubility.—Soluble in water (12 parts).

Uses.—Proposed as a remedy for derangements of the urinary secretion, characterized by excess of earthy phosphates, but is little used.

Dose.—Grs. x. to xv. = gm. 0.66 to 1.00, in solution, well diluted.

AMMONII BROMIDUM, NH_4Br . M. wt. 98. **Bromide of Ammonium.**

The pure salt in colorless, anhydrous, prismatic crystals, or in granular form, neutral reaction, and without odor. It becomes yellow by exposure.

Solubility.—Soluble in water ($1\frac{1}{2}$ parts), in alcohol (150 parts), and sparingly in ether.

Tests.—*Ammonium bromate*; red color on addition of strong hydrochloric acid. *Metallic impurities*; residue on subliming. *Ammonium chloride*; dissolve ten grains in water, acidulate with nitric acid, and add a solution of silver nitrate; collect the precipitate on filter, wash, dry, and weigh; it should weigh 19.15 grains; more indicates chlorides.

Uses.—In affections of the base of the brain especially, and of the cervical and dorsal portions of the spinal cord, when the symptoms indicate a state of congestion of these parts, as in cerebro-spinal and

basilar meningitis, severe occipital headaches, convulsive cough as in whooping-cough, epileptiform diseases, etc.

Dose.—One grain = gm. .06 for each year of age up to 20 years.

AMMONII CARBONAS, $\text{NH}_4\text{HCO}_3 \cdot \text{NH}_4\text{NH}_2\text{CO}_2$. M. wt. 157.

Carbonate of Ammonium.

The pure commercial carbonate in white, hard, somewhat translucent masses. It is composed of one molecule each of acid carbonate of ammonium (NH_4HCO_3), and of carbamate of ammonium ($\text{NH}_4\text{NH}_2\text{CO}_2$), and is entirely converted into the former by exposure to the air.

Solubility.—Soluble in water and in glycerine (5 parts); slightly soluble in alcohol (carbamate only).

Tests.—*Fixed salts*; residue on strongly heating. *Sulphate of ammonium*; a white precipitate with a solution of barium chloride or nitrate. *Chloride of ammonium*; a white precipitate with a solution of silver nitrate—60 parts saturate 71.16 parts of citric, and 76.26 parts of tartaric acid.

Uses.—As a stimulant in depressed action of the heart, as in fainting, chloroform narcosis, after free hemorrhage, threatened thrombosis; also, in adynamia of pulmonary inflammations and eruptive fevers. Its action is transient. It is beneficial in hysteria with acidity, abdominal distention and eructations of gas. Usually administered in mucilage or in form of spiritus ammoniæ aromaticus (U. S. P.), a solution of carbonate, 1 *part*, aqua ammoniæ, 2½ *parts*, in alcohol and water q. s. to make 25 *parts*, with small amounts of aromatic essential oils.

Dose.—Grs. v. to x. = gm. 0.33 to 0.66.

AMMONII CHLORIDUM, NH_4Cl . M. wt. 53.5.

Chloride of Ammonium.

The purified anhydrous salt, in small cubical or octahedral crystals, or in a granular white powder, without odor.

Solubility.—Soluble in water (3 parts), glycerine (6 parts), sparingly in alcohol; insoluble in ether.

Tests.—*Sulphates*; a white precipitate with a solution of barium nitrate. *Iron*; blue color on adding a solution potassium ferrocyanide to a solution acidulated with hydrochloric acid. *Other metals*; coloration or precipitate on passing sulphuretted hydrogen into a solution

first neutral or acid, and, after filtering, rendered alkaline by ammonium hydrate. *Fixed impurities*; residue on strongly heating.

Uses.—Internally, in torpid, chronic catarrhal conditions of mucous membranes and of the glands, where the secretion is thick and tenacious, as in duodenal catarrh, catarrh of the bile-ducts, chronic bronchitis, and in the so-called bilious state where the tongue is pasty and constipation exists. It increases the blood pressure, and temporarily augments the function of every organ of the body, causing increased warmth and very rapid elimination of solids.

Dose.—Grs. i. to xx. = gm. 0.06 to 1.33. Locally, in solution of 1 part to water 8 parts, as a discutient to inflammatory swellings, as of the joints, glands, etc.

AMMONIUM HYDRATE, NH_4HO . M. wt. 35.

Ammonia. Hydrate of Ammonium.

In solution in pure water of the following strengths, as in U. S. P.

Aqua Ammonia.—Specific gravity 0.960, containing 10 per cent. of ammonia-gas (NH_3). M. wt. 17).

Aqua Ammonia Fortior.—Specific gravity .900, containing 28 per cent. of ammonia-gas (NH_3). Not used internally.

Spiritus Ammonia.—Specific gravity .810. A solution of ammonia-gas (NH_3) in alcohol, in proportion of 10 per cent. of its weight.

All preparations of ammonium hydrate should be kept in well-stopped bottles, in a cool place.

Tests.—*Empyreumatic substances*; evaporate aqua ammonia one-half, and neutralize with sulphuric acid; odor then becomes apparent. *Strength*; 32 parts aqua ammonia (10 per cent.) should dissolve 11.1176 of air-dry, crystallized oxalic acid without effervescence to a neutral, colorless, odorless liquid, which is not altered by ammonium sulphide, nor after addition of an acid by sulphuretted hydrogen, even after standing some time. All of above preparations should evaporate without residue when heated.

Uses.—The aqueous and spiritus solutions of 10 per cent. strength are occasionally used as stimulants in similar conditions, as with ammonium carbonate (which see). Locally, used to relieve the pain, and as an antidote to the bite of insects, venomous serpents, and rabid animals. Mixed with oil, 2 parts, it is used as a counter-irritant.

Dose.—Gtt. 10 to 30 = gm. 0.66 to 2.00.

AMMONII IODIDUM, NH_4I . M. wt. 145. Iodide of Ammonium.

The pure salt in white, granular form; becomes reddish-brown from exposure. Keep closely stopped and protected from light.

Solubility.—Freely soluble in water (1 part) and alcohol (9 parts).

Tests.—*Bromides and chlorides*; a white crystalline precipitate on dropping into alcohol a strong concentrated solution of the salt: or add to a solution excess of solution of silver nitrate, filter out and wash precipitate; digest in a solution of ammonium hydrate and filter; neutralize filtrate with nitric acid—a white precipitate indicates chlorides, yellowish white, bromides.

Uses.—As an organic stimulant in asthenic types of chronic disease with enfeebled circulation. It increases the functional activity of mucous and serous membranes, and of the glandular and lymphatic systems, both nutritive and eliminative.

It is useful in chronic headaches when circulation is feeble, and patient has a stupid, heavy look; also, to prevent caseous deposit from inflammatory exudation in pneumonias; in secondary syphilis with nervous symptoms; in chronic enlargement of liver and spleen of malarial origin, and as a local application to boils, buboes, abscesses, etc.

Dose.—Internally, grs. ij. to x. = gm. 0.13 to 0.66.

AMMONII NITRAS, NH_4NO_3 . M. wt. 80. Nitrate of Ammonium.

The pure salt in colorless prisms or needles, specific gravity 1.70, deliquescent, and decomposing, when gradually heated to 185°C . (365°F .), into water and nitrous oxide (N_2O) or laughing-gas.

Solubility.—Soluble in one-half its weight of water, and in alcohol (20 parts).

Tests.—*Fixed impurities*; residue when strongly heated on platinum foil. *Sulphates and chlorides*. White precipitate with solution of barium or silver nitrates when added to solution of the salt acidulated with nitric acid.

Uses.—As above indicated for the preparation of nitrous oxide.

AMMONII PHOSPHAS, $(\text{NH}_4)_2\text{HPO}_4$. M. wt. 132.**Phosphate of Ammonium.**

The pure salt in colorless, transparent crystals, specific gravity 1.678. It effloresces in dry air; is alkaline when in solution, but becomes acid on boiling, from loss of ammonia.

Solubility.—Soluble in water (four parts), insoluble in alcohol.

Tests.—*Metallic impurities*; precipitate with ammonium sulphhydrate, or from a solution made acid with hydrochloric acid with sulphuretted hydrogen. *Sulphate*; white precipitate with barium chloride, insoluble in nitric acid.

A solution of 20 grains of the salt completely precipitated with ammonio-magnesian sulphate—the precipitate washed, dried, and heated to redness, should weigh 16.8 grains.

Uses.—In gout and rheumatism in similar conditions in which alkalis are indicated; in diabetes to maintain the alkaline condition of the blood and diminish elimination of sugar.

Dose.—Grs. x. to xx. = gm. 0.66 to 1.33 in dilute solution, three times per day.

AMMONII SULPHAS, $(\text{NH}_4)_2\text{SO}_4$. M. wt. 132.

Sulphate of Ammonium.

The salt in colorless crystals, isomorphous with potassium sulphate; specific gravity 1.76; dissipated at a heat above 500° F. Heated with liquor potassæ or sodæ, ammonia-gas is evolved.

Solubility.—Freely soluble in water (1.3 parts); insoluble in absolute alcohol.

Uses.—Not used in medicine. Used in manufacture of ammonium hydrate, chloride, and ammonio-ferrie alum.

AMMONII VALERIANAS, $\text{NH}_4\text{C}_5\text{H}_9\text{O}_2$. M. wt. 119.

Valerianate of Ammonia.

The pure salt in white, lamellar crystals.

Solubility.—Freely soluble in alcohol, water, and glycerine.

Tests.—*Potassium or sodium acetate*; add excess of diluted hydrochloric acid, and permit the valerianic acid to separate; separate a portion of the underlying aqueous liquid, nearly neutralize with ammonia, and add a drop of dilute solution of ferric chloride; a red color indicates acetates. *Fixed impurities*; residue on heating on platinum foil, until vapors cease.

Uses.—As a cerebro-spinal stimulant in hysteria, hysterical spasm, dyspnœa, chorea, etc.

Dose.—Grs. j. to ij. = gm. 0.06 to 0.13, in solution.

AMORACIÆ RADIX. Horseradish Root.

The fresh root of *Cochlearia amoracia* (Linné).

Nasturtium amoracia (Gray).

Coniferæ. Siliquosæ.

Bentley and Trimen.

Constituents.—A *volatile oil*, said to have the same composition as that from mustard, *i. e.*, sulphocyanate of allyl (C_3H_5CNS); some authorities consider it sulphocyanate of butyl or tetryl (C_4H_9CNS); it is light colored, specific gravity 1.01, darkened by age, and is soluble in alcohol, carbon bisulphide, and essential oils. The other constituents are unimportant.

Preparations.—A tincture, $\frac{N}{10}$, prepared as follows:

Take of freshly grated horseradish root, *five parts* 5

pound it into a pulp, and mix thoroughly with

Alcohol, *four parts* 4

Macerate for eight days, agitating twice a day; transfer to a percolator and proceed to displace the tincture as directed in Sec. 40, Part I., using for the purpose

Diluted alcohol *Sufficient*

until the tincture obtained weighs *ten (10) parts*.

Note.—In above case, 5 *parts* of undried horseradish equal 1 *part* dried. The tincture, therefore, has the strength $\frac{N}{10}$.

Uses.—A diuretic in dropsy from atony of the vascular system; also as a local stimulant in relaxed conditions of the fauces, and to remove hoarseness caused by similar states of the larynx. It is also employed to relieve flatulency, and in dyspepsia, from torpidity of the gastric surfaces. Locally, the grated root in same conditions and in the same manner as ground mustard.

Dose.—Grs. x. to 3j. = gm. 0.66 to 4.00 in infusion (Sec. 23, Part I.), or equivalent in tincture.

AMPELOPSIS QUINQUIFOLIA. American Ivy.

The dried recent bark of the vine.

Vitaceæ.

Constituents.—*Albumen, sugar, pyrocatechin, tartaric acid, pectin, glycolate of calcium, potassium bitartrate, and calcium tartrate.*

Preparations.—A tincture, $\frac{N}{1}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

Uses.—A direct stimulant to the glandular system, mucous membranes, and skin.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to 3j. = gm. 0.66 to 4.00, or equivalent.

AMYGDALA AMARA. Bitter Almond.

The seed of the *Amygdalis communis* var. *amara*.

AMYGDALIS DULCIS. Sweet Almond.

The seed of the *Amygdalis communis* var. *dulcis*.

Rosaceæ. Amygdalææ.

Linné. Bentley and Trimen.

Constituents.—These are similar in character, though different in amounts, in both of above varieties. *Amygdalin* is found only in bitter almonds. The substances present in both are *fixed oil*, *mucilage*, both *cane-sugar* and *glucose*, two protein compounds, *amandin* and *emulsin*, both of which act as emulsifying agents in suspending the fixed oil when the almond is triturated with water. The emulsin decomposes the amygdalin of bitter almonds into hydrocyanic acid and benzaldehyd.

Uses.—Both varieties are sources of an expressed oil of almonds. Sweet almonds have been used to prepare a substitute for starchy foods in the treatment of diabetes. Oil of sweet almonds is used as a laxative for infants, a constituent of emulsions, pomades, hair-oils, and for the same purposes as olive oil.

The volatile oil of bitter almonds is a deadly poison, as are the almonds themselves when eaten in large amounts.

AMYGDALIS PERSICA. Peach Tree.

The fresh leaves.

Rosaceæ. Amygdalææ.

Linné.

Constituents.—The leaves, branches, and flowers yield a *volatile oil*, chemically identical with volatile oil of bitter almonds.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—To subdue gastric and intestinal irritation when the tongue is elongated and pointed, tip and edges red.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to 3j. = gm. 0.66 to 4.00; or, equivalent to water, 3iv. = gm. 128.00. Teaspoonful (gm. 4.00) every one or two hours.

AMYLENUM, C_5H_{10} . M. wt. 70. **Amylene.**

The pure amylene as a volatile, inflammable liquid, with a peculiar odor; boiling at 35° to 38° C. (95° to 100° F.); specific gravity 0.663 at 0° C. (32° F.).

Solubility.—Soluble in ether and alcohol, insoluble in water.

Uses.—One of the many new anæsthetics which have been tried and abandoned. It is rapid in its effects, but its use has been shown to be uncertain and dangerous.

AMYL NITRIS, $C_5H_{11}NO_2$. M. wt. 117. **Nitrite of Amyl.**

A yellowish, volatile liquid of disagreeable odor and somewhat oily consistence; boils at 96° C. (205° F.); specific gravity of liquid 0.877, and of vapor 4.03.

Solubility.—Miscible in all proportions with alcohol, ether, and chloroform; insoluble in water.

Tests.—*Nitrate of amyl*, *nitric acid*, and *valerianate of amyl* may be present if impure. Mix ten parts of the nitrite with two parts of a mixture of water of ammonia (one part), and water (nine parts); shake and allow mixture to separate; the watery portion should not redden litmus paper. Or add a small amount each of solution of silver nitrate and ammonium hydrate and warm; the mixture should not turn black.

Uses.—As a motor depressant, more especially in disorders characterized by vaso-motor spasm, as in megrim with pallor of the face, epilepsy when the aura is first felt, ague during the chill, and in syncope and chloroform poisoning; also in angina pectoris, spasmodic asthma, and in general when the functions of the motor tract of the cord is pathologically exalted, as in tetanus, strychnia poisoning, etc.

Dose.—Gtt. ij. to v. by inhalation from a handkerchief until quickening of the pulse ensues.

Repeat as effects pass off, if necessary.

AMYLUM, $C_6H_{10}O_5$. M. wt. 162. **Starch.**

The pure starch of *Triticum vulgare* (Graminaeæ) as a white, odorless, and tasteless powder.

Starch mucilage heated with sulphuric acid (one per cent.), passes first into a dextrine and dextrose ($C_6H_{12}O_6$), the dextrine then into glucose. The same conversion takes place through the agency of diastase, a principle present in the malted grain.

Its specific gravity is 1.5 in its usual condition, slightly greater (1.56) when completely dried. Exposed to the atmosphere, it absorbs from 10 to 13 per cent. of moisture.

Solubility.—Insoluble in alcohol, ether, and cold water. Soluble in hot water, gelatinizing on cooling. When its granules are broken by trituration with cold water, a small amount passes into solution.

Uses.—In mucilage, as a protective in irritated conditions of the skin. In powder, to allay itching eruptions of the skin.

Also as a test for iodine, with which the mucilage strikes a fine blue color, and for certain pharmaceutical purposes.

ANACARDIUM. Cashew-nut.

The fruit of *Anacardium occidentale*.

Terebinthaceæ. Anacardiaceæ.

Linné.

Constituents.—The pericarp of the nut contains an *oily, viscid liquid*, soluble in alcohol and ether, insoluble in water, and so acrid as to vesicate when placed in contact with the skin. This oil contains *cardol* ($C_{21}H_{30}O_2$), the vesicating principle, and an acid which, when pure, is white and crystalline, and has an aromatic, somewhat burning taste, but does not vesicate. *Tannin, gallic acid*, and a *soft resin* are also present in the nut. The kernel is edible, and contains a bland, fixed oil.

Uses.—The vesicating oil diluted with simple ointment, has been employed in the West Indies in treatment of alopecia areata, and in chronic eczema when circumscribed. It has been much lauded as a remedy for leprosy, and, doubtless, possesses some value in alleviating the disease.

ANAGALLIS ARVENSIS. Pimpernal.

The fresh plant of the red variety sometimes called red chickweed.

Primulaceæ.

Linné. Gray.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Not well defined. Has been used in Germany as a remedy for hydrophobia, and in nervous disorders producing melancholy, monomania, etc. Worth careful study.

Dose.—Tincture, $\frac{N}{1}$, gtt. ss. to j. = gm. 0.03 to 0.06, or equivalent.

ANDIRA. Cabbage-Tree Bark.

The bark of *Andira inermis* and *A. retusa*. The first of these species is a native of Jamaica, the second of Surinam and Cayenne.

Leguminosæ. Cæsalpinx.

Kunth.

Constituents.—Both contain the alkaloids *jamaicina* and *surinamina*, the former of which has been proven to be identical with berberina. The last is soluble in boiling water, slightly soluble in alcohol, ether, and cold water.

Tannin is also present with other usual constituents of plants.

Uses.—A West Indian remedy for lumbricoides.

Dose.—Grs. v. to xxx, = gm. 0.33 to 2.00 according to age. Given in infusion.

ANEMONE NEMOROSA. Wood Anemone.

The fresh plant gathered before the buds develop.

Ranunculaceæ. Anemoneæ.

Linné. Gray.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{II}$, as in Sec. 44, Part I.

Uses.—Suggested for trial of its influence over the nervous system, being of the same family as the *pulsatilla*.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent to water $\bar{3}iv$. = gm. 128.00. Teaspoonful doses (gm. 4.00).

ANEMOPSIS CALIFORNICA. Yerba Mansa.

The fresh root.

Laururaceæ.

Hooker.

Constituents.—*Volatile oil*, soluble in alcohol, chloroform, and ether; an *astringent principle*, which forms a precipitate with sulphate of iron. These include the active constituents.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{II}$, as in Sec. 45, Part I.

Uses.—From published accounts, this drug seems to exert a favorable influence in diseases of mucous membranes when subacute, or chronic, and characterized by undue secretion, with more or less irritation; hence its use in dysentery, diarrhoea, bronchial croup with profuse expectoration, gonorrhoea when discharge is profuse, etc.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to $\bar{3}j$. = gm. 0.33 to 4.00, or equivalent, every two or four hours. The small dose, if any acute symptoms are present.

ANETHUM GRAVEOLENS. Dill.

Umbelliferæ. Orthospermæ.

Linné.

Constituents.—A *fixed* and a *volatile* oil, Ol. Anethi, the latter of which is pale yellow, specific gravity .89, and is composed of anethene ($C_{10}H_{16}$), of lemon-like odor, and carvol, identical with that of Ol. carui.

Uses.—Dill water from the oil, as in Sec. 15, Part I., in doses of one dram = gm. 4.00, or the oil in doses of two to five minims = gm. 0.13 to 0.33, is sometimes of value to relieve flatulence, colic, or hiccough from indigestion.

ANGELICA. Angelica Root.

The root of the cultivated European *Angelica officinalis*, and of the wild American *Archangelica atropurpurea*.

Umbelliferæ. Orthospermæ.

Mœnch. Hoffman.

Constituents.—The garden angelica contains an *amorphous, bitter principle*; a volatile acid, *angelic*; an acrid, resinous principle, *angelicin*, crystallizing from alcohol in colorless needles; a *volatile oil*; a *white, waxy matter*; *tannin*, and the principles common to all plants. The American plant has a similar composition.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—In chronic bronchitis to increase expectoration, and as a vascular excitant in torpid conditions of the system, chronic rheumatism, gout, intermittents, etc.

Dose.—Tincture, $\frac{N}{I}$, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent.

ANGUSTURA. Angustura Bark.

The bark of *Galapea cusparia*.

Rutaceæ.

Bentley and Trimcn.

Constituents.—*Volatile oil*; *two resins*, one hard and bitter, soluble in alcohol, insoluble in ether, and one soft and balsamic, soluble in alcohol and ether; a bitter principle, *angusturine* or *cusparine*, crystalline, slightly soluble in water, freely in alcohol, acids, and alkalies, insoluble in ether and volatile oils; *gum* and *woody fibre*.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—A bitter tonic, slightly stimulant, and without astringency,

adapted to adynamic fevers, with gastric disturbances prominent, or in dyspepsia and anorexia, with muscular debility. Tropical diarrhœas, and dysenteries of an atonic character, with considerable amounts of mucus in discharges, are often cured by it.

Dose.—Grs. x. to xxx. = gm. 0.66 to 2.00, or equivalent.

ANILINA, C_6H_7N . M. wt. 93. Aniline.

A colorless, oily, inflammable liquid, of a burning taste and peculiar odor, specific gravity 1.02, boiling-point $182^\circ C.$ ($359.8^\circ F.$). It dissolves phosphorus, camphor, some resins; forms soluble crystallizable salts with acids, which, in contact with air, acquire a red color. The colors known as aniline are produced by its oxidation.

Solubility.—Soluble in alcohol, aldehyd, acetone, fixed and volatile oils, and ether.

Uses.—From a medical standpoint it is unimportant except as a poison. It produces staggering, loss of sensibility and motion, quickening of pulse and respiration, cyanosis, headache, giddiness, weakness of lower limbs, and, in large doses, death during convulsion, or in some cases coma.

Locally, it induces eruptions on the skin, which is sometimes the result of the use of stockings, gloves, etc., dyed with aniline. Freë emesis, followed by appropriate stimulants, are indicated when a dangerous dose is swallowed.

ANISUM. Anise Seed.

The fruit of *Pimpinella anisum*.

Umbelliferæ. Orthospermæ.

Linné. Bentley and Trimen.

Constituents.—*Volatile and fixed oil, resin, gum, sugar, and salts.* The volatile oil, *Ol. Anisi*, cannot be chemically distinguished from that of *Illicium anisatum* (which see), and the commercial oil is often from that source. It is pale-yellow, specific gravity .97 to .98, and solidifies into a mass at a low temperature, 2° to $10^\circ C.$ (35.6° to $50^\circ F.$). The oil contains a hydrocarbon ($C_{10}H_{16}$) in small amount; but anethol ($C_{10}H_{12}O$), a substance of fainter odor than the oil, is the predominant constituent; oxidizers convert anethol into anisic acid (C_8HO_3). *Ol. anisi* is freely soluble in alcohol, and wax, spermaceti, or similar adulterants may be detected by their insolubility in this fluid.

Preparations.—The volatile oil, *Ol. Anisi* of commerce.

A tincture, $\frac{N}{10}$, with alcohol from the oil, as in Sec. 46, Part I.

A medicated water, $\frac{N}{500}$, from the oil, as in Sec. 15, Part I.
(Spts. anisi, U. S. P. = $\frac{N}{10}$)

Uses.—The volatile oil, or infusion of the fruit, is stimulant to mucous membranes of bronchial surfaces, and is useful in catarrhal conditions thereof, when chronic. The oil is also a general stimulant, and is employed in flatulent colic, and to prevent griping. Anise water is a useful vehicle for purgatives, to expel flatus and allay infantile colic.

Dose.—Of the powdered fruit in infusion (Sec. 23, *b*, Part I.), grs. x. to xxx. = gm. 0.66 to 2.00.

Of the oil, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent. Anise water, 3j. to 5j. = gm. 4.00 to 32.00.

ANTHEMIS NOBILIS. Chamomile Flowers.

The flowers.

Compositæ, Anthemidæ.

Linné. Bentley and Trimen.

Constituents.—Roman or English chamomile contains a dark-green *volatile oil*, *Oleum Anthemidis*, to which most of its properties may be attributed; *resin*, a *bitter principle*, *fixed oil*, *wax*, *gum*, *albumen*, *chlorophylle*, and *salts*.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

The volatile oil, *Ol. Anthemidis*, of commerce.

Uses.—To lower reflex excitability in summer diarrhœa of children, when the discharges are slimy, many colored, or green, child fretful, peevish, and ill-humored; also in severe abdominal pains, colic, restlessness, reflex cough, spasmodic asthma, and whooping cough.

Dose.—Grs. x. to xv. = gm. 0.66 to 1.00, infused (Sec. 23, *b*, Part I.) in a teacup of boiling water. Teaspoonful every hour, or equivalent amounts of above tincture with water 5iv. = gm. 128.00. Teaspoonful doses (gm. 4.00) every hour.

The oil in doses of gtt. j. to v. = gm. 0.06 to 0.33.

ANTIARIS. Upas Antiar or Poison.

The gum resinous exudation of *Antiarus toxicaria*, of waxy consistence, brown color, very bitter and acrid taste.

Urticacæ, Artocarpeæ.

Lesch.

Constituents.—A poisonous principle, *antiarin* ($C_{14}H_{20}O_5$), soluble in alcohol, alkalies, and acids, slightly soluble in ether; a non-poisonous *resin*, soluble in ether, slightly in alcohol, *sugar*, *gum*, *albumen*, and *wax*.

Uses.—A deadly poison to the muscular system. Used in Java as an arrow poison. It suspends both voluntary muscular action and that of the heart without causing convulsions. Not used in medicine.

ANTIMONII ET POTASSII TARTRAS, $2\text{KSbOC}_4\text{H}_4\text{O}_6, \text{H}_2\text{O}$.
M. wt. 668. Tartrate of Antimony and Potassium. Tartar Emetic.

The salt in colorless crystals, which are rhomboid octahedra, or in white powder of feebly acid reaction.

Solubility.—Soluble in water (17 parts), insoluble in alcohol.

Tests.—Sulphuretted hydrogen gives an orange precipitate with a solution of the salt, acidulated with hydrochloric acid. Twenty grains of the salt should yield, after washing, drying at 100°C . (212°F .), 9.91 grains of the sulphide. *Arsenic* will be indicated by the odor of garlic produced, by carefully heating 20 or 30 grains of the salt to redness.

Preparations.—Triturations as in Sec. 49, Part I.

(Vinum antimonii, U. S. P. = $\frac{\text{N}}{250}$.)

Uses.—Useful, if used judiciously, avoiding its depressing effects, in congestion and spasmodic affections of the larynx and bronchi with wheezing, difficult breathing, and with sonorous or sibilant ronchi, voice hoarse, cough hollow and barking.

Dose.—Add one grain to one-half pint of water, and give a teaspoonful every one-quarter to one-half hour, avoiding emesis and lengthening the time as its effects appear, or in one-quarter grain doses of trituration of $\frac{\text{N}}{100}$ and $\frac{\text{N}}{1000}$.

APIS MELLIFICA. Honey Bee.

Apiara. Melitidæ. Hymenoptera.

This remedy is prepared as follows, according to Homœopathic authority, from which the method is taken: "Living bees are put in a bottle and irritated by shaking; then five times their weight of strong alcohol poured over them. The whole is macerated for eight days, being shaken twice a day, after which the clear liquid is decanted." This tincture corresponds to the first decimal potency of the Homœopathic scale, or would be of the strength $\frac{\text{N}}{10}$, according to the plan of this work. (Sec. 46, Part I.)

Uses.—A valuable and certain diuretic in suppression of urine from atony; also in œdematous swellings involving the cellular and mucous tissues, and characterized by stinging, burning pains.

Dose.—Tincture, gtt. j. to x. = gm. 0.06 to 0.66 in water, $\bar{\text{z}}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

APOCYNUM ANDROSEMIFOLIUM. Dogsbane.

The root.

Apocynaceæ.

Linné.

Constituents.—A trace of *volatile oil*, a *caoutchouc-like body*, and a *bitter principle*, the exact nature of which has not been determined. It yields its virtues to alcohol.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

Uses.—For many years this and an allied species (*A. cannabinum*) have been used indiscriminately, partly because their therapeutic value has always been considered as identical, partly because their identity was not well established. The roots of both species were brought in the market and sold as one or the other, as the demand indicated. These questions are as yet not satisfactorily determined. For properties see *Apocynum cannabinum*.

APOCYNUM CANNABINUM. Indian Hemp.

The root.

Apocynaceæ.

Linné.

Constituents.—A *bitter principle* of an undetermined character, *resin*, *gum*, *starch*, *tannin*, *gallic acid*, and *wax*.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

Uses.—Indicated in muscular atony, especially of the blood-vessels when exudation occurs, causing dropsy, which may take the form of anasarca, cedema, or serous exudation. It increases arterial pressure, and promotes rapid absorption and elimination of the accumulated water by the kidneys. It is curative in the absence of fever, when the pulse is soft and weak, the superficial cellular tissues cedematous. It will often prove palliative in dropsy from cardiac disease or portal obstruction, or even in hydrothorax by keeping down effusions.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xxx. = gm. 0.33 to 2.00, or equivalent added to water \mathfrak{z} iv. = gm. 128.00. Teaspoonful doses (gm. 4.00) every one or two hours.

APOMORPHIA HYDROCHLORAS, $C_{17}H_{17}NO_2HCl$. M. wt. 303.5.**Hydrochlorate of Apomorphia.**

The pure salt in form of grayish-white, crystalline powder, mixed with small, colorless, shining crystals.

Solubility.—Soluble in water (6.8 parts) and alcohol (50 parts); insoluble in ether and chloroform.

Tests.—*Free acid*; test paper to aqueous solution, which should be colorless and without effect on the paper. Treated with ether or chloroform, if it colors either it is unfit for use. Should be kept in closely-stopped bottles, free from moisture.

Uses.—Hypodermically, to produce emesis in doses of $\frac{1}{16}$ of a grain of a freshly-prepared aqueous solution, and internally, in doses of $\frac{1}{8}$ of a grain for same purpose. Indicated when swallowing is difficult or impossible, or when the stomach is highly inflamed. It may fail when narcosis exists, as its action depends on its direct influence on the origin of the pneumogastric and on the spinal cord. Recommended to relieve orthopnoea of asthma and to produce emesis when indicated in sunstroke.

AQUA. Water.

Natural water, such as river or spring water, boiled and filtered.

AQUA DISTILLATA, H₂O. M. wt. 18. Distilled Water.

Pure water, obtained by distilling from 100 *parts* of water 5 *parts*, which are rejected, and a subsequent 80 *parts*, which are preserved as pure. A glass or tin condenser must be used.

Tests.—Insidid, odorless, and colorless, evaporating without residue. *Metals*; precipitates with sulphuretted hydrogen. *Chlorides*; white precipitate with silver nitrate. *Sulphates*; white precipitate with barium chloride. *Calcium salts*; white precipitate with solution ammonium oxalate. *Carbonic acid*; white precipitate with lime-water. *Organic matter*; slightly color with permanganate of potash, acidulate with a few drops of sulphuric acid and boil; if the color disappears organic matter is present.

Uses.—For all permanent aqueous solutions. Whenever water is mentioned in the pharmacy of this work, or in giving solubilities, distilled water is meant. Aqua, as above described, may be used in extemporaneous solutions.

The medical uses of water of different temperatures are extensive, but cannot be discussed here for want of space.

AQUA ACIDI CARBONICI. Carbonic Acid Water.

Water which has been impregnated with 5 times its bulk of carbonic acid gas (CO₂. M. wt. 44), and kept in the glass vessels with block-tin fittings, and known as siphons.

Tests.—There should be no discoloration by sulphuretted hydrogen or precipitate by sodium sulphate or potassium ferrocyanide.

Uses.—As an anæsthetic injection to palliate pain in cases of rectal, uterine, or vaginal cancer.

To allay vomiting and to quench the thirst of fevers.

AQUA CHLORINII. Chlorine Water.

A 0.3 per cent. solution in water of chlorine gas. Cl. At. wt. 35.5.

Preparation.—Introduce into a flask of suitable size,

Black oxide of manganese, <i>four parts</i>	. . . . .	4
Hydrochloric acid, <i>twenty-four parts</i>	. . . . .	24
Water, <i>fifteen parts</i>	. . . . .	15

Apply a gentle heat, and by suitable tubes conduct the gas generated through a wash-bottle containing

Water, <i>fifteen parts</i>	15
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and, afterwards, to the bottom of a bottle of the capacity of five hundred parts of water, into which has been introduced

Distilled water, <i>one hundred and fifty parts</i>	150
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and the mouth of which is loosely stopped with cotton. When the air has been displaced by the chlorine, disconnect the bottle, insert its stopper, and agitate until the gas ceases to be absorbed. The receiving bottle should be kept as near as possible at a temperature of 10° C. (50° F.), throughout the process.

Uses.—Locally, diluted (one in six) with water, or water and syrup, as a gargle or lotion for the mouth and throat in diphtheria, scarlatina, gangrenous ulceration, and as a local application to sloughing wounds. May be used in spray, 5 to 10 drops in water. A solution of calx chlorinata (one in eight) in water, or water and alcohol may be used as a lotion instead of the chlorine water, or more highly diluted, internally, to correct fetor of the breath. (See *Calx Chlorinata*.)

ARAROA. Goa Powder.

From Andira araroba.

An ochreous yellow, sometimes light brown, or even chocolate colored powder of bitter taste.

Leguminosæ.

Dr. J. M. D'Aguiar.

Constituents.—*Gum*, a *glucoside*, a *resin*, a *bitter principle*, and about 80 per cent. of *chrysophanic acid*. The last is its important constituent, and is soluble in benzole, ether, and hot alcohol.

Uses.—The principal source of chrysophanic acid, and used for the same purposes. (See *A. Chrysophanic*.)

ARALIA HISPIDA. Dwarf Elder.

The fresh bark.

ARALIA NUDICAULIS. American or Wild Sarsaparilla.

The fresh root.

ARALIA RACEMOSA. Spikenard.

The fresh root.

ARALIA SPINOSA. Toothache or Angelica Tree.

The fresh bark.

Araliaceæ.

Linné.

Constituents.—None of the aralias have been accurately examined.

Preparations.—From each of above.

A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—*A. hispida*. In dropsies, especially ascites, and as a diuretic. *Dose*, grs. j. to 3j. = gm. .06 to 4.00 in infusion (Sec. 23, *b*, Part I.), or equivalent in tincture.

A. nudicaulis. Under the names of American, wild or white sarsaparilla; it has considerable reputation in chronic, syphilitic, rheumatic, and cutaneous difficulties. *Dose*, grs. ij. to 3j. = gm. .13 to 4.00 in infusion (Sec. 23, *b*, Part I.), or equivalent in tincture.

A. racemosa. For dry, wheezing coughs with difficult inspiration, sense of suffocation, and soreness behind the sternum. *Dose*, grs. x. to 3ss. = gm. 0.66 to 2.00 in infusion (Sec. 23, *b*, Part I.), or equivalent in tincture, three times per day.

A. spinosa. In chronic rheumatic and cutaneous disorders, and for colic and toothache, being stimulant, pungent, and acrid. *Dose*, grs. x. to 3j. = gm. 0.66 to 4.00, in decoction (Sec. 18, Part I.), or equivalent in tincture.

ARECA. Areca Nut.

The seed of Areca catechu or betel-nut tree.

Palmæ.

Linné. Bentley and Trimén.

Constituents.—A concrete *fixed oil*; a *red tannin*, similar to that of ordinary catechu. The ash contains ferric oxide and magnesium phosphate.

Uses.—Occasionally used to destroy tapeworm.

Dose.— ʒij. to ʒiij. = gm. 8 to 12, in powder suspended in syrup.

ARGEMONE MEXICANA. Prickly Poppy.

Papaveraceæ.

Linné.

Constituents.—Leaves and capsules said to contain a small amount of morphia. The seeds yield 36.2 per cent. of a light-yellow, bland, fixed oil, specific gravity (61.8° F.) .919, which dries slowly, and is insoluble in six volumes of 90 per cent. alcohol.

Uses.—The juice, which is acrid, has been used, when inspissated, as a hydragogue cathartic in dropsies. The fresh juice is applied by the Mexicans to ulcers, warts, and opacities of the cornea. The oil expressed from the seeds is said to purge in doses of 30 drops = gm. 2.00. The plant, which seems quite active, is not well studied.

ARGENTUM, Ag. At. wt. 108. Silver.

The pure metal prepared by the reduction of the chloride by boiling with glucose and carbonate of sodium, and washing the powder thus obtained with acetic acid and water.

A black powder, specific gravity 10.47 when fused; dissolves in hot, diluted nitric acid, and is completely re-precipitated from this solution (as chloride of silver) on addition of hydrochloric acid. The filtrate from the precipitate thus obtained should evaporate without residue, and should yield no reaction with sulphuretted hydrogen followed by ammonia.

Preparations.—A trituration, as in Sec. 49, Part I.

Uses.—To prepare argenti nitras.

In trituration, $\frac{N}{100}$ to $\frac{N}{1000}$, in advanced cases of dysentery with suspected ulceration of the bowels.

ARGENTI CYANIDUM, AgCN. M. wt. 134. Cyanide of Silver.

The pure chemical as a white powder, decomposed by boiling concentrated acids with evolution of hydrocyanic acid. It is very poisonous, and easily decomposed by exposure to light.

Solubility.—Soluble in ammonia and hyposulphite of sodium; insoluble in dilute acids, water, and alcohol.

Uses.—To prepare, extemporaneously, Acidum hydrocyanicum dilutum, as follows:

Take of Cyanide of silver, <i>six parts</i>	.	.	.	.	.	.	6
Hydrochloric acid, <i>five parts</i>	.	.	.	.	.	.	5
Distilled water, <i>fifty-five parts</i>	.	.	.	.	.	.	55

Mix the acid and water, add the cyanide, and shake well together in a glass-stoppered bottle; permit the precipitated chloride of silver to subside, and pour off the clear liquid for use. It contains two per cent. of hydrocyanic acid.

ARGENTI NITRAS. AgNO_3 . M. wt. 170. Nitrate of Silver.

The pure chemical in transparent, anhydrous, rhombic, crystalline plates. It is decomposed by light and contact with organic substances.

Solubility.—Soluble in cold water (1 part), and in alcohol (26 parts); sparingly dissolved by ether and chloroform. Nitrous ether is the best solvent for most local uses.

Tests.—*Nitrates of alkalies*; add to a solution hydrochloric acid as long as precipitation occurs; warm and filter; the filtrate, when evaporated to dryness and strongly heated, should leave no fixed residue. *Copper and iron*; neutralize the filtrate of preceding test with ammonia, and add a solution of potassium ferrocyanide; a red precipitate indicates copper, a blue indicates iron. *Argentio chloride*; a white turbidity on solution in water, disappearing on addition of ammonium hydrate.

ARGENTI NITRAS FUSA. Lunar Caustic.

Same as above, fused, with five per cent. of argentic chloride added to toughen, and the mass moulded into sticks or pencils.

Uses.—The remedial value of this agent depends upon its forming an insoluble compound with the albuminous constituent of tissues with which it may be brought into contact. The superficial thin layer formed acts as a protective from the irritation of the air to the tissue beneath; it also condenses it, and contracts its blood-vessels. It is internally used in chronic, obstinate diarrhoea, and dysenteries with discharges of pinkish mucus (in pill $\frac{1}{3}$ to $\frac{1}{4}$ gr.), and in the same forms of gastric disorders in which arsenic is used. Locally used in ulcerations and chronic inflammations of the mucous membranes; in skin eruptions as herpes, lichen, eczema, the eruption of zona, and to allay the itching of pruritis. It checks local inflammation, such as superficial abscess, boils, synovitis, and prevents pitting in small-pox; early application is necessary for success. The solution in nitrous ether (grs. ij. to x. to $\bar{3}$ j.) is preferable for local use. To prevent pitting from small-pox, each vesicle should be ruptured on the fourth or fifth day at the latest, and

a sharply pointed stick of the nitrate inserted into it, or it may be punctured with a sharp needle dipped in a four per cent. solution.

Antidote.—Common salt in solution, followed by an emetic and demulcents.

ARGENTI OXIDUM, Ag_2O . M. wt. 232. Oxide of Silver.

The pure oxide as an olive-brown powder, turning black on heating, and losing its oxygen at a red heat, leaving metallic silver as a spongy residue. It is also slowly reduced by sunlight.

Solubility.—Soluble in water (3000 parts), in hydrate of ammonium, in solution of barium nitrate, and in hot nitric acid. This acid solution, when completely precipitated by hydrochloric acid and filtered, should evaporate leaving no residue, and should give no reaction with sulphuretted hydrogen followed by supersaturation with ammonium hydrate.

Uses.—Similar to Argenti nitras (which see), but less caustic. For gastralgia, chronic gastric catarrh, and gastric ulcers.

Dose.—Grs. $\frac{1}{2}$ to 2 = gm. 0.33 to 1.33, in pill form with some vegetable extract.

ARNICÆ FLORES. Arnica Flowers.

The flowers of *Arnica montana*.

ARNICÆ RADIX. Arnica Root.

The rhizome and rootlets of *Arnica montana*.

Compositæ. Seniconidæ.

Linné. Bentley and Trimen.

Constituents.—Both the root and flowers yield *gum, wax, and salts*. Both contain a *volatile oil* which differ from each other. A principle termed *arnicine*, which is differently described by different observers, is found principally in the flowers. Several *resins* are also reported, and about ten per cent. of inulin in the root. Altogether the chemical examinations of arnica are not satisfactory. *Trimethylamine* is recently announced as a most important constituent.

Preparations.—*For internal use*, a tincture, $\frac{N}{2}$, with alcohol, from the recent root, as in Sec. 43, Part I. (tinctura arnicæ radicis, U. S. P. = $\frac{N}{10}$).

For local use, a tincture, $\frac{N}{5}$, with diluted alcohol, from the flowers, as in Sec. 48, Part I. (tinctura arnicæ florum, U. S. P. = $\frac{N}{5}$).

Uses.—Both internally and locally, when there exists myalgic pains, pains from strains, bruises, or falls, or of traumatic origin, sanguineous

effusions and bruises from blows, falls, etc., hemorrhages from mechanical violence, cerebral and pulmonary congestion from severe shock, shortness of breath from intercostal myalgia, acute superficial inflammations, as in boils, erysipelas, etc.

The tincture of the flowers is used locally for bruises, sprains, etc., well diluted with water.

Dose.—The tincture of the root is preferable for internal use. Gtt. x. to xx. = gm. 0.66 to 1.33, to water ℥iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

ARNOTTA. *Arnotta*.

A coloring matter obtained from the seeds of *Bixa orellana*.

Bixaceæ.

Linné.

Constituents.—*Yellow coloring matter*; soluble in water and a bright red matter, *bixin*, imperfectly soluble in cold alcohol and ether, but soluble in alkalies. Strong sulphuric acid colors bixin blue. Several other compounds, among which are a *turpentine body* and a *fatty acid*, are also present.

Uses.—Used as a coloring for plasters, ointments, butter, and cheese, and as a dye stuff. For use it is dissolved in four or five times its weight of olive or cotton-seed oil, after previous disintegration by digestion with alcohol.

ARSENICI IODIDUM, AsI_3 . M. wt. 456. Iodide of Arsenic.

Arsenious Iodide.

The pure salt in orange-red crystalline scales. It should be kept in a cool place, and in well-stopped bottles.

Solubility.—Soluble in alcohol (10 parts), ether, glycerine, and in water ($3\frac{1}{2}$ parts). Its aqueous solution partially decomposes when kept.

Tests.—*Insoluble matters*; by solution in distilled water. *Metallic impurities*; residue on heating strongly. It should be completely volatile.

Preparations.—A trituration as in Sec. 49, Part I.

Uses.—This powerful remedy combines the prominent medicinal characters of both its elementary components. Used in diseases of the mucous membranes, when the discharges are of an irritating or corrosive character, as in influenza, hay fever, nasal catarrh, otorrhœa, serofulous ophthalmia, corrosive leucorrhœa, etc. It is very valuable for glandular tumors, malignant ulceration of mucous surfaces of scarlatina,

diphtheria, and in burning and itching eruptions of a dry, scaly character, as in psoriasis, tinea, lepra, etc.

Dose.—Should always be given in trituration (or granule $\frac{1}{100}$ gr.) not lower than $\frac{N}{102}$ for adults.

ARUM TRIPHYLLUM. Indian Turnip.

The undried tuber (corm) of *Arisæme (arum) triphyllum*, gathered before the leaves develop.

Arceæ.

Linné. Gray.

Constituents.—*Starch, gum, fatty matters, and a volatile acrid principle*, upon which the medicinal value of the drug depends, and which is soluble in ether.

Preparations.—The preparations of this drug are quite unstable, owing to the volatile character of its active principle.

A tincture, $\frac{N}{10}$, as follows:

Grate finely a convenient quantity of the undried corm. Estimate the water present by rapidly drying a sample of say 100 grains of the freshly-grated drug.

Take of the grated corm sufficient to represent of the dry drug,

one part	1
Glycerine sufficient to make, with the estimated water present, four parts	4
Alcohol, three parts	3

Incorporate the drug with the glycerine and alcohol by rubbing together in a mortar; transfer to a percolator and macerate for 8 days; then run off the tincture as directed in Sec. 47, using diluted alcohol, and continuing the process until the tincture obtained

Weighs ten parts 10

Uses.—In sudden inflammatory swelling of the tissues of the mucous surfaces of the mouth, fauces, and air passages, with pricking, stinging pains, and burning discharges. It is used by homœopathic practitioners in decimal dilution from the sixth upward. It is a useful stimulant in chronic, non-inflammatory conditions of the same parts when the tissues are relaxed and full or secreting profusely. The dried drug has but little activity.

Dose.—Tincture, $\frac{N}{10}$, gtt. v. to xx. to water or syrup $\tilde{\text{iv}}$. = gm. 128.00. Teaspoonful doses (gm. 4.00).

ASAFÆTIDA. Asafætida.

The gum resin of commerce from *Narthex asafætida*, containing at least 60 per cent. of matters soluble in alcohol.

Umbelliferæ. Orthospermæ. Falconer. Bentley and Trimén.

Constituents.—*Resin, volatile oil, and ferulaic acid* ($C_{10}H_{10}O_4$), soluble in alcohol; *gum and inorganic salts*, soluble in water, insoluble in alcohol.

Preparations.—A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I. [Tinctura asafœtidæ, U. S. P. = $\frac{N}{5}$.]

Uses.—In flatulence of hysteria, hypochondria, and that of young children; and as an antispasmodic in hysterical convulsions and spasm in childhood from reflex irritation.

Dose.—Grs. v. to xv. = gm. .33 to 1.00 in pill.

Tincture, $\frac{N}{5}$, 3ss. to 3j. = gm. 2 to 4. For children, tincture, 3ss. to 3j. to water 5viiij. Teaspoonful every half hour until relieved. Same by enema for convulsions.

ASARUM CANADENSE. Wild Ginger.

The recent rhizome and rootlets.

Aristolochiaceæ.

Linné.

Constituents.—*Aromatic volatile oil, starch, gum, fatty matters, an acrid resin, yellow coloring matter, uncrystallizable sugar, and a small amount of a feebly basic alkaloid.*

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—An aromatic stimulant in low forms of febrile diseases, and in colic. In hot infusion it produces sweating, resembling serpentaria in its action.

Dose.—Grs. x. to 3j. = gm. 0.66 to 4.00 in infusion, or equivalent in tincture.

ASCLEPIAS INCARNATA. Flesh-colored Asclepias.

The fresh rhizome and rootlets.

* *Asclepiadaceæ.*

Gray.

Constituents.—Two *resins*, an *alkaloid, fixed oil*, and a small amount of *volatile oil*, with *albumen, starch, pectin, and glucose.*

Preparations.—Same as with *A. syriaca*, which see.

Uses.—Not well defined, but probably similar to *A. syriaca*. Both increase the urine and perspiration.

ASCLEPIAS SYRIACA. Silkweed.

The fresh rhizome.

Asclepiadaceæ.

Linné.

Constituents.—The plant contains *caoutchouc*, *resin*, and a crystalline principle, *asclepien* ($C_{20}H_{34}O_3$), *gum sugar*, and *salts*. The root probably has a similar composition, although it has not been analyzed.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—In dropsy, hepatic, renal or cardiac, and in that following scarlatina and variola; congestive headaches from suppression of urine or sweat, and those forms of nervous headache followed by sweating or profuse urination. It causes diaphoresis, and augments the urinary secretion, the solid constituents of which are largely increased. It has proved valuable in acute rheumatic inflammation of the large joints.

Dose.—Grs. v. to xxx. = gm. 0.33 to 1.33 in decoction or equivalent in tincture.

ASCLEPIAS TUBEROSA. Pleurisy Root.

The fresh root.

Asclepiadaceæ.

Linné. Gray.

Constituents.—*Two resins*, soluble in alcohol, one soluble, the other insoluble in ether; *fixed oil*; an odorous *volatile principle*; a *peculiar principle* having the taste of the root, soluble in ether, alcohol, and much water; *pectin*, *gum*, *tannin*, and *albumen*.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—In diseases of children, to allay nervous irritability and increase secretion from the skin; in pleurisy, pleurodynia, bronchitis, when there are sharp cutting or darting pains aggravated by deep breathing. Most useful when the fever is slight, or has been controlled by other means.

Dose.—Grs. x. to xx. = gm. 0.66 to 1.33 in infusion or equivalent amounts in tincture added to a glass of water, and given frequently in teaspoonful doses.

ASPARAGUS OFFICINALIS. Asparagus.

The fresh roots and shoots.

Liliaceæ. Asparagineæ.

Linné.

Constituents.—The root contains yellow *resin*, *gum*, *sugar*, *albumen*, *chlorides*, *malates*, *acetates*, and *phosphates*. The shoots, and probably the whole plant, a peculiar proximate principle found in many other vegetable juices, and called *asparagin* ($C_4H_8N_2O_3.H_2O$).

Preparations.—A tincture, $\frac{N}{10}$, prepared from equal parts of fresh

roots and shoots mined, pounded to a pulp, weighed, and treated as with *Arum triphyllum*, which see.

Uses.—To increase the flow of urine when the kidneys are involved, in general dropsy, hydrothorax, etc.

Dose.—Gtt. j. to xx. = gm. .06 to 1.33.

ASPIDIUM FILIX-MAS. Male Fern.

The rhizome.

Filices.

Swartz. Bentley and Trimen.

Constituents.—*Filicic acid* ($C_{14}H_{18}O_5$), in granular crystals, soluble in alcohol and ether; *tannin*; 6.9 per cent. of a green *fixed oil*, *volatile oil*, both soluble in alcohol and ether; *sugar*, *starch*, *gum*, and *salts*.

Preparations.—Oleoresin *Aspidii*, $\frac{4}{1}$ ^N, as in Sec. 25, Part I. (Oleo resin *aspidii*, U. S. P., is made by percolation with ether, and bears a variable relation to the drug, but is usually from 10 to 12 times as strong as the powdered root.)

Uses.—As a direct poison to certain intestinal worms, especially the *bothriocephalus latus* and *tænia solium*. The drug should be administered after a preliminary fast over night. A dose of castor-oil or other purgative having been given the day previous, to empty the intestinal canal, the patient being restricted to a diet of milk, the remedy may be administered in the morning.

Dose.—Of the powdered drug, grs. xxx. to ʒij. = gm. 2 to 8, in divided doses at intervals of an hour. The oleo-resin may be used in equivalent amount ($\frac{1}{4}$ dose of powder), suspended in mucilage, or, after concentration to about one-half its bulk, it may be given in capsules.

ATROPIA, $C_{17}H_{23}NO_3$. M. wt. 289. Atropine.

The alkaloid of *Atropa belladonna* in colorless, acicular crystals, or in yellowish-white, crystalline powder.

Solanaceæ.

Linné. Bentley and Trimen.

Solubility.—Soluble in water (600 parts), in cold alcohol ($2\frac{1}{2}$ parts), in cold ether (60 parts), in glycerine (3 parts), and chloroform (3 parts).

Tests.—Yellow precipitate with solution of auric chloride. Dilatation of pupil of the eye. Wholly dissipated at a red heat.

ATROPIÆ SULPHAS ($C_{17}H_{23}NO_3$)₂H₂SO₄. M. wt. 676.

Sulphate of Atropine.

The pure sulphate in white, slightly crystalline powder.

Solubility.—Freely soluble in water and alcohol; insoluble in ether and chloroform; soluble in glycerine (33 parts).

Tests.—An aqueous solution gives a white precipitate with solution of barium chloride. Dilatation of pupil of the eye. Dissipated at red heat.

Uses and Antidotes.—(See *Belladonna*.)

AURANTII AMARI CORTEX. Bitter Orange Peel.

The rind of the fruit of *Citrus vulgaris*.

AURANTII DULCIS CORTEX. Sweet Orange Peel.

The fresh rind of the fruit *Citrus aurantium*.

Aurantiacæ.

Risso. Bentley and Trimen.

Constituents.—The composition of both the bitter and sweet orange peels are the same, except that the latter contains less of the bitter principle *hesperidin*; this principle is insoluble in cold water and ether, crystallizable, and soluble in alcohol and ammonia. By grating and pressing, the rinds of both yield an oil, *Oleum Aurantii corticis*, which consists of the hydrocarbon *hesperidene*, $C_{10}H_{16}$, and an *oxygenated body*, $C_{10}H_{16}O$. The oil of the bitter peel is pale-green or greenish-yellow, varying in specific gravity from 1.83 to 1.88, soluble in alcohol (7 to 10 parts), specific gravity 0.85, and boiling at $180^{\circ} C.$ ($356^{\circ} F.$). The oils from either variety thicken on exposure to the air and acquire a turpentine-like odor. This can be retarded by adding five per cent. of alcohol and filtering. Orange peel also contains *fixed* and *volatile oil*, *resin*, *gallic acid*, *gum*, and *albumen*.

Preparations.—The pure essential oil of commerce.

From the bitter orange peel.

A tincture, $\frac{N}{1}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{5}$, with diluted alcohol, as in Sec. 48, Part I.

(Tinct. aurantii amari, U. S. P. = $\frac{N}{5}$.)

From sweet orange peel,

A tincture, $\frac{N}{5}$, from the colored portion of the sweet orange peel, recently grated from the fresh fruit, and treated with alcohol, as in Sec. 48, Part I.

[Tinct. aurantii dulcis, U. S. P. = $\frac{N}{5}$. Syrupus aurantii, U. S. P. = $\frac{N}{20}$.]

Uses.—As a stimulant to digestion, as an adjunct and flavor to other medicines. Either tincture may be added to simple syrup as a convenient form of administration (one to seven).

AURANTII FLORES. Orange Flowers.

The flowers of *Citrus aurantium* and of *C. vulgaris*.

Aurantiacæ.

Risso. Bentley and Trimen.

Constituents.—Volatile oil (in commerce oil of neroli, *Oleum Aurantii florum*), which is the hydrocarbon ($C_{10}H_{16}$), with a small amount of an inodorous camphor; a *bitter extractive*, *acetic acid*, *gum*, and *salts*.

Preparations.—A flavored water, *Aqua Auranti florum*, as follows:

Take of orange flowers, <i>five parts</i>	.	.	.	.	.	.	5
Water, <i>ten parts</i>	.	.	.	.	.	.	10
Mix together in a suitable apparatus and distil off, <i>five parts</i>	.	.	.	.	.	.	5

Uses.—Orange flower water is used as an agreeable and refreshing flavoring and vehicle having no active medicinal properties.

AURI CHLORIDUM, $AuCl_3 \cdot 4H_2O$. M. wt. 375.2.

Auric Chloride or Chloride of Gold.

The pure salt in yellow, needle-shaped, deliquescent crystals, containing 47.80 per cent. of pure gold.

Solubility.—Soluble in alcohol, water, ether, and essential oils. These solutions, except that in water, gradually decompose by the reduction of the salt.

Tests.—Solubility and quantitative analysis.

AURI ET SODII CHLORIDUM, $AuCl_3 \cdot NaCl \cdot 2H_2O$.

Chloride of Gold and Sodium.

The pure crystallized salt in four-sided prisms, a mixture of equal parts of auric chloride ($AuCl_3 = 302.2$), and sodic chloride ($NaCl = 58.5$).

Solubility.—It is deliquescent. Soluble in water and one-half of it in alcohol.

Uses.—In medicinal doses, a powerful organic stimulant increasing the functional activity of the skin, kidneys, intestinal and salivary glands; promoting appetite and digestion; increasing mental activity, and possessing the properties called alterative in an eminent degree. Used successfully in secondary and tertiary syphilis, amenorrhœa from torpor, sterility, sexual incompetence, scrofula, disturbances of digestion and assimilation, hypochondria and mental depression, especially from abuse of alcohol, etc.

Dose.—Grs. $\frac{1}{50}$ to $\frac{1}{20}$ in pill or solution, well diluted.

AZEDARACH. Azedarach.

The bark of the root of *Melia azedarach*, a tree indigenous to China and India, and naturalized in Southern United States.

Meliaceæ.

Linné.

Constituents.—A *bitter resin*, soluble in alcohol, chloroform, and ether, insoluble in water, benzine, and oil of turpentine, slightly in bisulphide of carbon. The other constituents are unimportant.

Uses.—In India, and in southern portions of the United States, it is used as a vermifuge for lumbricoid ascarides in tablespoonful doses of a decoction, made by boiling two ounces (gm. 64) of the fresh bark in a pint of water until reduced to half a pint. It is given every two or three hours until nausea is produced, and is followed by a cathartic.

BALSAMUM PERUVIANUM. Balsam Peru.

The pure balsam from *Myroxylon pereiræ*, sp. gr. 1.15, of a reddish-brown, nearly black color, and agreeable odor resembling vanilla.

Leguminosæ, Papilionaceæ. Klotzsch. Bentley and Trimen.

Constituents.—It is a mixture of *oily matters*, with $\frac{1}{4}$ to $\frac{1}{3}$ of *resinous matter* and 6 per cent. of *cinnamic acid* ($\text{HC}_9\text{H}_7\text{O}_2$).

Solubility.—Soluble in alcohol and ether; insoluble in water.

Tests.—*Fixed oils*; indicated by insolubility in alcohol. If *alcohol* is present a shrinkage in volume will take place on admixture with water.

Preparations.—A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 46, Part I.

Uses.—As a local stimulant to unhealthy ulcers and open wounds, to promote granulation, remove fetor, and protect from the atmosphere. Locally, also, for chilblains, and in itch. Internally, in chronic bronchitis with profuse fetid secretion, and in similar conditions of air passages and other mucous membranes. The tincture is a convenient form for internal use.

Dose.—10 to 20 drops. May be dropped on sugar, or given in emulsion with gum and sugar or yolk of egg. Locally, it may be applied on lint, or in ointment made with adeps or ungt. paraffini. A one per cent. solution in ether or alcohol may be used with the atomizer in laryngeal and bronchial disorders.

BALSAMUM TOLUTANUM. Balsam Tolu.

The balsam of *Myroxylon toluifera*, of a yellowish-brown color, fragrant odor, sweetish taste, of the consistence of resin, and readily softening under the teeth.

Leguminosæ, Papilionaceæ.

Kunth.

Constituents.—Like balsam Peru, it contains *cinnamen*, *cinnamic acid*, and *resin*, the latter existing in much larger amount than in balsam Peru.

Solubility.—Soluble in alcohol and ether, and yields only its acid to water.

Tests.—*Common resin*; odor of sulphurous acid (SO_2) on heating with sulphuric acid.

Preparations.—A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 46, Part I. [Syrupus tolutanus, U. S. P. = $\frac{N}{25}$. Tinctura tolutana, U. S. P. = $\frac{N}{10}$.]

Uses.—In chronic bronchitis with profuse expectoration in absence of fever; also as a flavor.

Dose.—Tincture, $\frac{N}{10}$, ʒss. to ʒj. = gm. 2.00 to 4.00, suspended in mucilage or syrup.

BAPTISIA TINCTORIA. Wild Indigo.

The fresh root.

Leguminosæ, Papilionaceæ.

Robert Brown.

Constituents.—*Resin* and a bitterish, acrid *alkaloid*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A dried extract, $\frac{4N}{1}$, as in Sec. 20, Part I.

Uses.—In typhoid conditions, characterized by enfeebled capillary circulation, oppressed pulse, mucous membranes livid or blanched, with tendency to ulceration, secretions having a putrid odor.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent in water, ʒiv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

BARII CARBONAS. BaCO_3 . M. wt. 197. Carbonate of Barium.

The pure salt, as a white, tasteless, and odorless powder.

Solubility.—Insoluble in water and alcohol; somewhat soluble in carbonic acid water.

Tests.—*Barium sulphate*; white residue on treating with hydrochloric acid. *Alumina*; white precipitate on adding ammonium hydrate to

acid solution. *Metals*; precipitate, or change of color, on treating with sulphuretted hydrogen. *Lime*; add excess of sulphuric acid to solution in hydrochloric acid, filter, and to the filtrate add ammonium oxalate; a white precipitate indicates lime.

BARIUM CHLORIDUM. $\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$. M. wt. 244. Chloride of Barium.

The pure salt, in colorless, four-sided plates.

Solubility.—Soluble in water ($2\frac{1}{2}$ parts).

Tests.—*Metals*; a dark precipitate, or coloration, with sulphhydrate of ammonium. *Calcium, sodium, and potassium*; to a solution add excess of sulphuric acid, stir and filter; divide the filtrate into two parts. To one neutralized by ammonia, add ammonium oxalate; a white precipitate indicates lime. Evaporate the second part to dryness, heat to redness; a residue coloring the flame yellow indicates sodium; dissolve this residue in a few drops of hydrochloric acid, and add a few drops of platinum bichloride; a yellow precipitate indicates potassium.

BARIUM IODIDUM. $\text{BaI}_2 \cdot 2\text{H}_2\text{O}$. M. wt. 427. Iodide of Barium.

The pure salt in a grayish powder, which decomposes on exposure to the air.

Solubility.—Soluble in water and alcohol.

Tests.—*Barium carbonate* from exposure to the air. Effervescence on adding an acid, and partial insolubility.

Antidotes.—All the soluble salts of barium are powerful poisons, and must be used with caution. They may be antidoted by the soluble sulphates, followed by emetics.

Uses.—Salts of barium are used for their influence on the glandular system. The carbonate and chloride are used in scrofulous indurations of the cervical glands and tonsils, in locomotor ataxia, in bronchocoele, and in cutaneous diseases. The iodide, which is the most powerful of the salts, may be used in hypertrophy of connective tissue of any of the glands, and in phlyctenular conjunctivitis, and scrofulous ulcers.

Dose.—Grs. $\frac{1}{100}$ in trituration, $\frac{N}{102}$ to $\frac{N}{104}$ (Sec. 49, Part I.), three times a day, or equivalent in solution (iodide or chloride) of one per cent. strength, $\frac{N}{100}$.

BEBERINÆ SULPHAS. $\text{C}_{38}\text{H}_{42}\text{N}_2\text{O}_6 \cdot \text{H}_2\text{SO}_4$. M. wt. 720.

Sulphate of Beberine.

Lauracæ.

Bentley and Trimen.

The sulphate of the alkaloid beberine, bebera, or biberina, obtained

from *Nectandra rodiaei*, in brown, translucent scales, yellow when powdered, and very bitter.

Solubility.—Soluble in alcohol and water.

Tests.—*Mineral matter* ; residue on incineration. Alkalies give a pale-yellow precipitate with aqueous solutions.

Uses.—As a substitute for quinia sulphate, as a bitter tonic and anti-periodic, and in similar doses and conditions ; also in menorrhagia with active circulation. It does not affect the head.

Dose.—Grs. i. to xx. = gm. .06 to 1.33, according as it is used as a tonic or febrifuge. May be given in pill form, trituration, or solution.

BELÆ FRUCTUS. Bael Fruit.

The fruit of *Ægle marmelas*.

Aurantiacæ.

De Condolle. Bentley and Trimen.

Constituents.—Their nature is not well settled. Stated to contain a variety of tannin, but this is questioned.

Uses.—Introduced from India as efficacious in atonic diarrhœas and dysenteries. Usually given in form of fluid extract made by concentration of a decoction and addition of sufficient alcohol to preserve it.

Dose.—ʒj. to ʒss. = gm. 4.00 to 8.00.

BELLADONNÆ FOLIA. Belladonna Leaves.

The recent leaves of *Atropa belladonna*.

BELLADONNÆ RADIX. Belladonna Root.

The recent root of *Atropa belladonna* from plants more than two years old.

Solanacæ.

Linné. Bentley and Trimen.

Constituents.—The alkaloid *atropia* is the important constituent of both the root and herb of *A. belladonna*. In addition they contain *belladonna*, a fluorescent substance, and the common constituents, *gum*, *albumen*, etc. The leaves contain asparagin, and the root red coloring matter, *atrosin*.

Preparations.—From both root and leaves :

A tincture, $\frac{x}{v}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{x}{2}$, with alcohol, as in Sec. 43, Part I.

(Abstractum belladonnæ, U. S. P. = $\frac{x}{2}$.)

From leaves only :

A dried extract, $\frac{4^N}{I}$, with alcohol, as in Sec. 20, Part I.

An extract, $\frac{X^N}{I}$, with alcohol, as in Sec. 19, Part I.

[Ungt. belladonnæ = $\frac{N}{100}$, made with extract of leaves.] See *Atropia*.

Tr. belladonnæ, U. S. P., is approximately of the strength $\frac{N}{7}$ ($\frac{1.5^N}{100}$), and is made from the leaves only.

Uses.—Is used in small doses as a vaso-motor stimulant, diminishing the calibre of blood-vessels, relieving capillary engorgement, giving a freer circulation, thus antagonizing congestion, and the perversion of function resulting from this condition. The remedy is indicated by such symptoms as swelling and duskiness of surface, dulness and hebetude, dilatation of pupil, coma, drowsy, sleepy state, deep redness of the mucous membranes of pharynx and fauces, and dryness of the throat. Incontinence of urine and diabetes insipidus, due to enfeeblement of the circulation, are often cured by belladonna. It is also prophylactic against scarlatina. All the foregoing conditions require the small dose, *i. e.*, an amount short of what begins to dilate the pupil or cause dryness of the throat. Larger doses, or the long continuance of the small, produce relaxation of unstriated muscular fibre, which fact is sometimes utilized in spasm, as of the sphincters, the ureters, uterus, vagina, bladder, and intestines; also in whooping-cough after the inflammatory stage, in nervous cough, laryngeal spasm, and, locally, in strangulated hernia. In such cases, gr. j. = gm. 0.06, or equivalent in form of tincture or extract, repeated until relaxation begins. Belladonna antagonizes the poisonous effects of opium, given in small doses, repeated often until the pulse and respiration improve, and the contracted pupil begins to assume its natural dilatation. Atropia or its sulphate are commonly used hypodermically in doses of $\frac{1}{100}$ of a grain, cautiously increased in severe cases to $\frac{1}{50}$ of a grain to relieve spasm and the accompanying pain, and also in neuralgia, especially tic douloureux and sciatica. Injection in the neighborhood of the nerve trunk affected is preferable. Locally, atropia solution (4 grs. to \mathfrak{z} j.) brushed over the surface is useful to arrest unilateral sweating, local abscess, as carbuncle, boils, etc., and to arrest secretion of milk. Should be washed off as soon as systemic effects appear.

Dose.—Tincture, $\frac{N}{I}$, grs. j. to x. = gm. 0.06 to 0.66, to water \mathfrak{z} iv. Teaspoonful doses (gm. 4.00) every hour.

BENZINUM. Petroleum Benzine.

The colorless, transparent benzine of commerce, specific gravity 0.670 to 0.675. A few drops poured into the hand should rapidly evaporate, leaving no odor. Boils at temperature of 50° to 60° C. (122° to 140° F.).

Solubility.—Insoluble in water; soluble in six times its weight of alcohol, 90 per cent.; and in ether, chloroform, fixed and volatile oils.

Tests.—*Sulphur compounds*; odor after evaporation, and brown color on mixing with one-fourth its volume of spirits of ammonia, adding a few drops of solution of silver nitrate, and warming. *Ben-zol*; indicated if soluble in less than six times its weight of alcohol, 90 per cent.

Uses.—As a solvent for certain oils, and for removing oils and grease from fabrics. Being highly inflammable, it should be kept in a cool place, away from fires or lights.

BENZOIN ODORIFERUM. Spice Bush.

The fresh bark and fruit.

Lauraceæ.

Nees.

Constituents.—*Resin, volatile oil, fixed oil, tannin, starch, and sugar.*

Preparations.—From both bark and berries.

A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—An aromatic, vascular stimulant, useful in chronic rheumatism, intermittents, and in the forming stage of acute pulmonary inflammations.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to 3j. = gm. 0.33 to 4.00, or equivalent.

BENZOINUM. Gum Benzoin.

The best quality of the gum-resin of commerce obtained from the *Styrax benzoin*.

Styraceæ.

Dryander. Bentley and Trimen.

Constituents.—*Resin*; soluble in alcohol (75 to 80 per cent.). 50 per cent. of this resin is soluble in ether, 3 or 4 per cent. in a solution of sodium carbonate, and 25 per cent. in alcohol only. *Benzoic acid* (15 per cent.); soluble in alcohol and in water (200 parts).

Preparations.—A tincture, $\frac{N}{3}$, with alcohol, as in Sec. 48, Part I.

Uses.—It is useful in chronic bronchial catarrhs in the absence of fever and gastric irritation, which contra-indicate its employment. Used internally in tincture, $\frac{N}{3}$, 3ss. to 3j. = gm. 2.00 to 4.00, suspended in syrup or glycerine, or by atomizer. Locally, the tincture is used to saturate dressings of foul, unhealthy wounds, to stimulate granulation and destroy fetor. Mixed with glycerine, it is used for chapped hands

and cracked nipples. Added to lard, it prevents rancidity (see *Benzoinated Lard*, Part I.).

BENZOLUM, HC_6H_5 . M. wt. 78. Benzol. Hydride of Phenyl.

The colorless, volatile liquid, obtained from coal-tar, boiling between 80° and 95° C. (176° and 185° F.), sp. gr. .850. It is soluble in alcohol, ether, and acetone; and is a solvent for caoutchouc, fats, gutta-percha, volatile oils, some resins and alkaloids.

Uses.—Chiefly used in the manufacture of nitrobenzol and anilina. It has been used, locally, in favus, sycosis, herpes, and scabies.

BERBERIS AQUIFOLIUM. Oregon Grape.

The root.

Berberidaceæ. *Berberæ.* *Mahonia.*

Pursh.

Constituents.—No complete analysis is in print. It is known to contain *berberina* ($\text{C}_{20}\text{H}_{17}\text{NO}_4$) and a white *alkaloid*, and probably is analogous in composition to other members of the genus.

Preparations.—A tincture, $\frac{\text{N}}{\text{I}}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{\text{N}}{\text{Z}}$, with alcohol, as in Sec. 43, Part I.

Uses.—Introduced and extolled as a remedy for chronic syphilitic and cutaneous affections. Its benefits in these cases are doubtless due to increased constructive metamorphosis, made possible by the removal of relaxed or catarrhal conditions of the gastro-intestinal mucous surfaces.

Dose.—Tincture, $\frac{\text{N}}{\text{I}}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent.

BERBERIS VULGARIS. Barberry Bark.

The bark of the root.

Berberidaceæ.

Linné. Bentley and Trimen.

Constituents.—An alkaloid, *berberia*, or berberina ($\text{C}_{20}\text{H}_{17}\text{NO}_4$), of yellow color, identical with the yellow alkaloid of *Hydrastis can.* (*hydrastia*); *tannin*, giving dark-green precipitates with iron salts; *oxycanthin*, *starch*, and the ordinary constituents of vegetables.

Preparations.—A tincture, $\frac{\text{N}}{\text{I}}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{\text{N}}{\text{Z}}$, with alcohol, as in Sec. 43, Part I.

Uses.—In relaxed and catarrhal conditions of the gastro-intestinal mucous membranes, following the subsidence of acute inflammatory symptoms. It increases natural secretion, promotes the flow of gastric juice, and thus aids the appropriation of food and the repair of tissue.

Dose.—Tincture, $\frac{\text{N}}{\text{I}}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent.

BETULA LENTA. Sweet or Cherry Birch.

The fresh bark and leaves.

Betulaceæ.

Linné.

Constituents.—By contact with water and distillation, both bark and leaves yield a *volatile oil* identical with oil of gaultheria, which is mainly methyl salicylate ($\text{CH}_3\text{C}_7\text{H}_5\text{O}_3$) and hydrocarbon, gaultherilene. This oil is said not to preëxist in the drug, but is the product of the action of an unknown constituent upon *gaultherin* in the presence of water. This constituent is colorless, syrupy, soluble in alcohol and water, and, distilled with mineral acids, yields oil of gaultheria.

Preparations.—From both the fresh bark and leaves.

A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—The North European birch (*B. alba*) is a popular remedy in rheumatic, gouty, and cutaneous diseases. The presence in the *B. lenta* of a compound allied to the salicylates would suggest its probable equal value. It is worth investigation.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent.

BIDENS BIPINNATA. Spanish Needles.

The fresh herb.

Compositæ, Senecionidææ.

Linné.

Constituents.—Not known.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Popularly employed in laryngeal and bronchial complaints, and as an emmenagogue. These uses will suggest the line of investigation.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent.

BISMUTHI ET AMMONII CITRAS. $\text{Bi}_3\text{HO} \cdot (\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7$.

M. wt. 504. Citrate of Bismuth and Ammonium.

In glossy, translucent scales, becoming opaque and losing its solubility on exposure to the air.

Solubility.—Soluble in water, sparingly in alcohol; insoluble in ether and chloroform. When rendered less soluble by exposure, it may be again dissolved by adding, drop by drop, solution of ammonium hydrate.

Tests and Uses.—See *Bismuth subnitrate*.

BISMUTHUM PURIFICATUM, Bi. At. wt. 210.**Purified Bismuth.**

Bismuth which has been freed from arsenicum by roasting, repeated fusion (two or three times) with ten per cent. of nitrate of potash, conversion into oxynitrate, and final reduction to metal with charcoal at a high temperature.

Tests.—*Copper*; if present may be detected by blue color on solution of metal in nitric acid and addition of aqua ammonia.

Uses.—In preparation of medicinal salts of bismuth.

BISMUTHI SUBCARBONAS, $\text{Bi}_2\text{O}_2\text{CO}_3$. M. wt. 512. **Oxycarbonate, Subcarbonate, or Carbonate of Bismuth.**

The pure chemical as a white, odorless, and tasteless powder.

Solubility.—Insoluble in water and alcohol.

Tests and Uses.—See *Bismuth subnitrate*.

BISMUTHI SUBNITRAS, $\text{BiONO}_3 \cdot \text{H}_2\text{O}$. M. wt. 306.**Subnitrate or Oxynitrate of Bismuth.**

The pure chemical as a tasteless, odorless, white powder.

Solubility.—Sparingly soluble in water after long digestion, which alters its composition.

Tests.—*Carbonate*; effervescence with acid. *Insoluble admixtures*; residue on treating small amounts (10 grains) with a mixture of nitric acid and water (f3iss each). *Chlorides and sulphates*; take acid solution preceding, dilute, filter, and divide into two portions; to one add solution of silver nitrate—a white precipitate indicates chlorides. To the other portion add a few drops of a solution of barium nitrate—a white precipitate indicates sulphates. *Lead*; a white precipitate on adding a few drops of sulphuric acid to concentrated solution of bismuth subnitrate in a mixture of equal parts of nitric acid and water. *Arsenic*; mix 5 grains with potassium bitartrate 10 grains, and heat slowly to redness in an iron spoon—odor of garlic indicates arsenic.

The foregoing tests are applicable to subcarbonate.

Uses.—Used to ease the pain and lessen the gastric irritation in disorders of the stomach with weight, fulness, and cramping after eating; also in chronic gastritis of drunkards, ulcer, and chronic inflammation of the stomach, pyrosis, etc.; in affections of the mucous membrane, aphthæ, nursing sore mouth, cholera infantum and summer diarrhœa, diarrhœa of phthisis, and generally in gastro-intestinal irritability with

or without vomiting, when the tongue is red, pointed, and papillæ prominent, and there is uneasiness or pain in the stomach with a tendency to diarrhœa. Suspended in glycerine it is used locally in gonorrhœa and leucorrhœa. In powder, applied to the skin in erythema, interigo, and acne rosacea.

Dose.—Of the carbonate or nitrate, grs. v. to 3j. in milk, or suspended in water or in powder.

Of citrate, 2 grains in solution. The form sold as liquor bismuth, which usually contains 2 grains bismuth and ammonia citrate to each fluidrachm. The insoluble preparations are preferable.

BISTORTA. Bistort.

The rhizome of *Polygonum bistorta*.

Polygonaceæ.

Linné. Bentley and Trimen.

Constituents.—*Tannic* and *gallic* acids, and much *starch*. The tannin amounts to 21 per cent.

Uses.—As a simple astringent to relaxed mucous surfaces, internally and locally. (See *Tannic* and *Gallic Acids*.)

Dose.—In decoction, 3j. to 3ij. = gm. 4.00 to 8.00 (Sec. 18, Part I.).

BOLDUS. Boldo.

The leaves of *Peumus boldus*.

Monimiaceæ.

Constituents.—About two per cent. of a mixture of *volatile oils* of pungent taste and odor, resembling pepper, freely soluble in alcohol; an *alkaloid*; one-tenth per cent. *boldine*, bitter, slightly soluble in water, freely in alcohol, ether, chloroform, and benzol; *tannin* and aromatic *resin*, soluble in alcohol, with other unimportant substances.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—In atonic conditions of the stomach and intestinal canal, as a stimulant to digestion, and for a supposed marked influence on the circulation of the liver in malarial affections; also, for gonorrhœa and catarrhal conditions of the mucous membranes.

Dose.—Tincture, $\frac{N}{I}$, grs. v. to xx. = gm. 0.33 to 1.33, or equivalent.

BORAGO OFFICINALIS. Borage.

The recent plant.

Boraginaceæ.

Linné.

Constituents.—A large amount of *mucilage*, *potassium*, and *calcium* compounds of organic and mineral acids, and a small amount of resin.

Uses.—In infusion (Sec. 23, Part I.), in acute pulmonary catarrhs, and in febrile and rheumatic affections. It moistens the skin, and is somewhat diuretic. Use freely.

BRAYERA. Kousso.

The dried blossoms of *Brayera anthelmintica*.

Rosaceæ.

Kunth. Bentley and Trimen.

Constituents.—*Koussin* ($C_{31}H_{38}O_{10}$), a resinous body in yellow crystals; *tasteless resin*, *two species of tannin*, and *volatile oil*, the last three soluble in alcohol; *gum*, *starch*, *wax*, and *fixed oil*, which are insoluble in alcohol.

Tests.—Pomegranate bark is sometimes added to the powder. With the whole blossoms this is easily detected.

Uses.—To expel tapeworm.

Dose.— $\text{℥ss.} = \text{gm. 16.00}$. Mix with lukewarm water and let stand 15 or 20 minutes; stir well and administer. May be preceded by a little lemon-juice.

Koussin is given in doses of 20 grains with some carminative.

BROMINIUM, Br. At. wt. 80. Bromine. Bromum, U. S. P.

The pure element, a dark-red, volatile liquid, emitting an odor of similar irritating character to chlorine; sp. gr. 2.990; boiling-point, $63^{\circ} \text{C. (145.4}^{\circ} \text{F.)}$.

Solubility.—Soluble in water (32 parts), from which it may be removed by agitation with chloroform, ether, or carbon bisulphide, in which it freely dissolves; soluble, also, in benzol and alcohol.

Tests.—*General*; its specific gravity and boiling-point (see above). *Iodine*; dissolve a small portion of bromine in a sodium hydrate solution, add excess of nitric acid, and shake the mixture with carbon bisulphide; if it is colored purple iodine is present. *Chlorine*; make an aqueous solution of bromine, and shake with its volume of ether; separate the watery portion, boil to expel dissolved ether, acidulate with nitric acid, and add excess of solution of argentic nitrate; wash and dissolve the precipitate in a solution of ammoniac carbonate, cool and evaporate to small volume, and add excess of nitric acid; chloride of silver falls as a white precipitate if chlorine is present.

Uses.—Owing to its strong chemical affinity for hydrogen it combines

with that component of tissue with which it comes in contact, liberates oxygen from water, and breaks up other combinations, producing, when strong, sloughing of the tissue substance. When used in dilute form the liberated oxygen acts as a stimulant to organic nervous system, especially influencing mucous membranes, the lymphatic and glandular systems.

Used by inhalation in croup, gtt. x. to hot water, $\bar{3}j$. The same as a deodorant in ozæna, for treatment of hay asthma and chronic nasal catarrh. Locally, it is applied with a glass rod to cancerous growths; also to arrest hospital gangrene. Internally, in homœopathic dilutions only.

BRYONIA. Bryony.

The recent root of *Bryonia alba*, gathered before the time of flowering.
Cucurbitaceæ. Linné.

Constituents.—A white, bitter glucoside, *bryonin* ($C_{48}H_{80}O_{19}$), soluble in alcohol and water, insoluble in ether, is the only principle of medical interest.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, *eight parts*, water, *two parts*, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, *eight parts*, water, *two parts*, as in Sec. 43, Part I.

(Tinctura bryonæ, U. S. P. = $\frac{N}{10}$.)

Uses.—In rheumatic, arthritic, and catarrhal inflammations involving the capillaries, especially of serous, synovial, and mucous membranes at the stage where exudation threatens, or has already taken place; also in headache of a distensive character, tissues full, hot, and dusky, pain burning, stitching, or tearing, and aggravated by motion.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent to water $\bar{3}iv$. = gm. 128.00. Teaspoonful doses (gm. 4.00).

BUCHU. Buchu Leaves.

The leaves of *Barosma betulina*, *B. crenulata*, and *B. serrotifolia*, *Willdenow*.

Rutacææ, *Diosmææ*. Bartling. Hooker. Bentley and Trimen.

Constituents.—*Volatile oil*, *barosma camphor*, a stearopten with a peppermint-like flavor, both soluble in alcohol; *resin*, *albumen*, *gum*, *coloring matters*, and *salts*.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—In sub-inflammatory and catarrhal conditions of mucous membranes of the genito-urinary organs, discharge mucopurulent, urine deficient or retained.

Dose.—Tincture, $\frac{N}{1}$, gtt. xv. to 3j. = gm. 1.00 to 4.00, or equivalent.

BUTYLCHLORAL HYDRAS, $C_4H_5Cl_3O.H_2O$. M. wt. 193.5.

Hydrous Butylchloral. Croton Chloral Hydrate.

The pure chemical heretofore known as crotonchloral hydrate, but which is now known to be trichlorobutylaldehyde ($C_4H_3Cl_3O$) combined with one molecule of water (H_2O), and hence called hydrous. The term hydrate has a special chemical use, inappropriate in this case. Hydrous butylchloral occurs in white silky scales. It is decomposed by alkalies, as in case of hydrous chloral (ethylchloral), producing chloride and formate of the alkali and dichlorallylene ($C_3H_2Cl_2$).

Solubility.—Freely soluble in alcohol and glycerine; slowly and but moderately in cold water; freely in hot water, with the vapors of which it volatilizes.

Preparations.—Solutions are liable to undergo change, and, therefore, should always be freshly prepared. Owing to its acrid, bitter taste, solutions are best made with some sweetened vehicle, as follows:

For Syrup Butylchloral hydras, $\frac{N}{50}$,

Take of Hydrous butylchloral, <i>two parts</i>	.	.	.	.	.	2
Glycerine, <i>six parts</i>	.	.	.	.	.	6
Ext. licorice, <i>four parts</i>	.	.	.	.	.	4
Water, <i>forty-five parts</i>	.	.	.	.	.	45
Syrup, <i>forty-five parts</i>	.	.	.	.	.	45

Add the butylchloral to the glycerine, previously warmed, and rub together in a mortar until solution is effected. Dissolve the extract of licorice in the water, add the syrup, and mix well with the glycerine solution.

Each teaspoonful represents about grs. iss. = gm. 0.08 of hydrous butylchloral.

Uses.—In neuralgia, especially of the fifth cranial nerve; the pains attending inflammation of the iris and choroid; headaches affecting either the anterior part of the head, or the occiput and upper part of the back of the neck; megrim, or so-called bilious sick headache; facial neuralgias and nervous headache of anæmic girls and women; tie douloureux, and neuralgic headaches about the menopause. Contraindicated in hyperæmia of the brain and in irritability of the stomach.

Dose.—Grs. j. to v. may be given every hour or two until 15

grains have been taken, stopping as its anæsthetic effects begin to be apparent. It is far inferior to chloral hydras as a hypnotic.

CACTUS GRANDIFLORUS. Night-blooming Cereus.

The youngest shoots and flowers fresh and undried. (Syn. *Cereus grandiflor.*)

Cactæ.

Gray.

Constituents.—No satisfactory analysis has been published.

Preparations.—A tincture, $\frac{N}{10}$, as in Sec. 47, Part I.

A tincture with *one part* fresh drug and *two parts* of alcohol (by maceration for four weeks followed by expression). This is the process for the essence of Homœopathic pharmacy.

Cereus Bonplandii, an allied species of cactus, may be prepared for use in similar forms.

Uses.—In functional diseases of the heart from disordered innervation characterized by irregularity, increased heart's action, oppression like great weight, and sense of impending danger. When the heart's action is excessive, as indicated by the symptoms, the remedy should be administered (if at all) in minute doses.

Cactus modifies the circulation of the brain, and has proven useful in diseases of this organ.

C. Bonplandii, especially, has proven valuable in amaurosis from disorders of the cerebral circulation. It is also used in similar cases to *C. grandiflora*, and in equivalent doses.

Dose.—Tincture, $\frac{N}{10}$, gtt. v. to 3j. = gm. 0.33 to 4.00, to water, 3iv. = gm. 128.00. Teaspoonful doses, gm. 4.00.

CADMII IODIDUM, CdI₂. M. wt. 266. Iodide of Cadmium.

The pure salt, in minute, pearly, crystalline scales.

Solubility.—Soluble in water and alcohol.

Tests.—*Zinc*; add excess of solution of potassium hydrate, filter, and add to filtrate solution of sulphhydrate of ammonia; a white precipitate indicates zinc.

CADMII SULPHAS, CdSO₄·3H₂O. M. wt. 262.

Sulphate of Cadmium.

The pure salt, in colorless prisms, efflorescent in air.

Solubility.—Freely soluble in water; insoluble in alcohol.

Tests.—*Zinc.* (See *Iodide Cadmium.*) *Other metallic oxides*; com-

pletely precipitate a solution with sulphuretted hydrogen, filter, and evaporate to dryness; a residue indicates admixture.

Uses.—The sulphate acts like that of zinc, but more powerfully. Used as a collyrium (grs. ij. to aq. rosæ ℥j.) to cause absorption of opacities of the cornea, and as a local application in otorrhœa and (1 gr. to ℥iv.) in gonorrhœa.

The iodide is used as an external application in form of ointment (1 part to ungt. paraffini 9 parts) to enlarged glands, nodes, and chronically inflamed joints; so applied, it produces the effects of iodine, but does not discolor the skin.

CAFFEA. Coffee.

The best quality of unroasted fruit of *Coffea arabica*.

Rubiaceæ, Coffeinæ.

Linné. Bentley and Trimen.

Constituents.—An alkaloid *caffèina* ($C_8H_{10}N_4O_2 + H_2O$), a form of *tannic acid*, and a *volatile oil*. All soluble in alcohol or ether; the first two in water, the last partly so.

Preparations.—A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 47, Part I.

The Homœopathic tincture represents 1 in 10 parts.

Used also in trituration. (Sec. 49, Part I.)

Uses.—Through the cerebro-spinal system, this remedy acts as an excitant of the function of every organ, increases nervous and vascular activity, and stimulates the sensory organs, the stomach, intestinal canal, genito-urinary apparatus, muscles, and skin. Indicated, therefore, in states of atony with disordered function of the organs. Its almost universal use as a beverage, in infusion of the roasted berries, has induced a state of tolerance, which impairs the usefulness of the remedy in this form. The active principle, caffeine, is more frequently used. Its effects are more marked, though somewhat different from either the crude or roasted berry. Strong infusion of roasted coffee is used to counteract opium poisoning, as a stimulant in adynamic fevers, in spasmodic asthma, and in some forms of headache.

Dose.—Tincture, $\frac{N}{10}$, gtt. j. to x.

CAFFEINA, $C_8H_{10}N_4O_2, H_2O$. M. wt. 212. Caffeine.

The pure alkaloid from *Coffea arabica*, in needle-shaped crystals or prisms.

Solubility.—Soluble in alcohol, water, and ether, and partially in glycerine.

Tests.—Should sublime without residue on careful heating on a sand-bath to 350° F. Dissolved and acidulated with nitric acid, evaporated nearly to dryness, and ammonia added, a brilliant purple color develops.

Preparations.—A trituration, $\frac{N}{10}$, as in Sec. 49, Part I.

Uses.—Used in states of atony with impaired function; in the impeded breathing of asthma; in depression of the circulation from various causes, to increase the action of the heart and the arterial tension; in headaches and neuralgias with enfeebled circulation; in stupor of uremia, or opium narcosis; in chronic catarrh of the stomach, and atonic diarrhoea, as of phthisis, summer complaint, etc.

Dose.—Gr. j. = gm. .06, internally or hypodermically, dissolved in water or glycerine, with a little spirit (1 gr. to 15 to 30 minims is the average). Repeat as effect subsides. As it acts through the nerve centres by increasing reflex excitability, it is contraindicated in states of nervous crethism, except in attenuated doses or trituration, $\frac{N}{10}$ 3 to $\frac{N}{10}$ 6.

CALCII BROMIDUM, CaBr_2 . M. wt. 200. Bromide of Calcium.

The pure chemical as a white granular salt, deliquescent and of neutral reaction.

Solubility.—Soluble in alcohol and water.

Tests.—*Chlorides*; add ammonium hydrate until distinctly alkaline, and then a solution of silver nitrate, and filter; acidulate filtrate with nitric acid. Should a white, curdy precipitate form, chlorides are present. *Nitrates and bromates*; add dilute sulphuric acid; no color will be produced if pure. Calcium bromide should be neutral to test paper, and soluble in alcohol and water without residue.

Uses.—Used in sleeplessness with or without great nervous irritability, when dependent on congestion of the brain. It is especially valuable in these conditions of children.

Dose.—Gr. j. = gm. .06 for each year of age up to twenty years, repeated, with interval of one to two hours, until the desired effect is produced. With young infants in milder cases of nervous irritation, $\frac{1}{10}$ gr. doses will be sufficient. Give in solution with milk or syrup.

CALCII CARBONAS, CaCO_3 . M. wt. 100. Carbonate of Calcium.

The pure salt as a white powder.

Solubility.—Completely soluble in dilute acetic, hydrochloric, or nitric acids.

Tests.—*Sulphate of lime*; agitate a portion of the carbonate with water and filter; acidulate the filtrate with nitric acid and add solution of barium nitrate; a white precipitate indicates sulphates. *Chloride of calcium*; to above filtrate, acidulated with nitric acid, add solution of silver nitrate; a white precipitate indicates chlorides.

Preparations.—Other forms of carbonate of calcium, sufficiently pure for medicinal purposes, are in use, such as chalk and prepared forms of it, as whiting, prepared chalk (*creta preparata*, U. S. P.), prepared oyster-shell (*testa preparata*, U. S. P.).

CALCII CHLORIDUM, CaCl_2 . M. wt. 111. Chloride of Calcium.

The pure anhydrous salt in lumps.

Solubility.—Soluble in alcohol and water.

Tests.—*Iron*; a black precipitate with sulphhydrate of ammonium to solution. *Hypochlorite of calcium*; odor of chlorine on adding hydrochloric acid. *Carbonic acid*; a white precipitate with lime-water.

Preparations.—A solution of *three parts* in distilled water sufficient to make *ten parts*. (Liq. Calcii Chloridi, $\frac{3\text{N}}{10}$.)

Uses.—The internal use of calcium hydrate, carbonate, or chloride is indicated, chiefly, in disorders of nutrition, characterized by pale skin, flabby, soft muscles, and a tendency to enlargements of the glands, or copious watery diarrhœa. Large doses are needless, as but small amounts are absorbed. Lime-water, saccharated solution of lime, and the carbonate are the preferable forms, the latter triturated; the first two should be given with food, or immediately after eating. Chloride of calcium is strongly recommended in serofulous enlargements of the neck, in 10 to 20 grain doses in milk, continued for a long time. Lime-water is used, locally, as a wash in discharges from the ear and vulva when inflammation is still present, in leucorrhœa and gleet, and to destroy thread-worms in the rectum. Lime-water mixed with linseed-oil, in equal parts, is used as an application to burns, and applied on cotton dipped in the mixture, and confined to the surfaces until convalescence, to prevent pitting in small-pox. Added to the food it checks the vomiting of curdled milk in children fed by bottle. Both the carbonate and lime-water are extensively used in diarrhœa.

Dose.—Of saccharated solution, ʒss. to ʒj. = gm. 2 to gm. 4.

Of chloride, grs. x. to xx. = gm. .64 to gm. 1.29, in milk.

Of carbonate, grs. v. to xx. = gm. .32 to gm. 1.29, or in trituration.

CALCII HYPOPHOSPHIS, $\text{Ca}_2\text{PH}_2\text{O}_2$. M. wt. 170.
Hypophosphite of Calcium.

The pure salt in white granular powder.

Solubility.—Soluble in water (6 parts); insoluble in alcohol.

Tests.—*Soluble phosphates and phosphites*; to separate portions of a solution in water, add sulphuric acid, solutions of barium and calcium chlorides, and solution of plumbic acetate. The solution, if pure, remains unchanged.

Preparations.—Triturations, $\frac{N}{10}$ to $\frac{N}{100}$, as in Sec. 49, Part I.

Syrup hypophosphites comp., in common use, contains in each 32 parts, 1 part of calcium hypophosphite and $\frac{1}{3}$ of a part each of sodium and potassium hypophosphites.

Uses.—In disorders of nutrition, especially of the nerve centres, the bones, glands, and assimilative organs; when the circulation is feeble; when there is great nervous prostration, the surface pallid, and extremities cold, and when there is a tendency to scrofulous enlargement of the glands, abscesses, tenderness of the thorax, hydrocephaloid diseases, after long illness, incipient phthisis, etc.

Dose.—In incipient phthisis, first to third trituration in doses of 1 gr. = gm. .06. In other conditions, grs. 1 to 2 = gm. .06 to .12, in powder, or in solution in glycerine or water, given at meal-time.

CALCII IODAS, $\text{Ca}_2\text{IO}_3 \cdot 6\text{H}_2\text{O}$. M. wt. 498. **Iodate of Calcium.**

The chemical in colorless, shining needles, and efflorescent. The aqueous solution is precipitated by oxalate of ammonium (calcium). Sulphurous acid liberates iodine, recognized by adding starch paste (blue color).

Solubility.—Soluble in water at 59° F. (300 parts); insoluble in alcohol.

Uses.—Not well defined.

CALCII IODIDUM, CaI_2 . M. wt. 294. **Iodide of Calcium.**

The pure chemical in white pearly scales, and deliquescent. Exposed to the air in solution, carbonate of calcium is precipitated as the solution decomposes.

Solubility.—Freely soluble in alcohol and water.

Tests.—*Chlorides and bromides* may be detected by mixing a solution with excess of solution of sulphate of copper and sulphurous acid,

removing the cuprous iodide and testing the filtrate with solution of nitrate of silver: no precipitate should occur.

Uses.—Similar in action to other iodides. It benefits scrofulous ulcers, and diminishes and deodorizes suppurative discharges.

Dose.—Grs. j. to iij. = gm. 0.06 to 0.20, three times per day.

CALCII PHOSPHAS PRÆCIPITATUS, $\text{Ca}_3\text{2PO}_4$. M. wt. 310.

Tribasic Phosphate of Lime. Precipitated Phosphate of Lime.

The pure chemical as a white, inodorous, and tasteless powder.

Solubility.—Insoluble in water or alcohol; soluble in dilute nitric or hydrochloric acids, and to a certain extent in carbonic acid water or acetic acid.

Tests.—*Carbonates*; effervescence on solution in nitric acid. *Sulphates*; a white precipitate on adding a solution of barium nitrate to solution in nitric acid. *Iron and other metals*; brown color of precipitate formed by treating the solution in nitric acid with sulphuretted hydrogen, and subsequently with a solution of ammonium hydrate, indicates iron; a black color, other metals.

Uses.—An essential food to soft and growing tissue in cases of malnutrition and deficient cell growth. Used in chronic wasting disease and hectic, when the phosphate is found in excess in the urine; in anæmia of young, rapidly growing persons, and accompanying diseases with exhaustive discharges, as in leucorrhœa, chronic bronchitis, chronic tubercular or nontubercular diarrhœa, abscess and scrofulous sores. Also used to control the unnatural growth and defective nutrition of bone and other textures found in rickets and similar diseased conditions. Large doses are useless and injurious. Should be given only after the active stages of these diseases have subsided.

Dose.—Grs. j. to ij. = gm. .06 to .13.

CALCII SULPHAS, $\text{CaSO}_4\text{2H}_2\text{O}$. M. wt. 172.

Sulphate of Calcium. Gypsum.

The pure sulphate in white crystalline or amorphous powder.

Solubility.—Soluble in cold water (380 parts), the solution becoming turbid on heating. Insoluble in alcohol.

CALCII SULPHAS USTA. Plaster of Paris.

The powder obtained by heating gypsum to between 100° and 200° C. (212° to 392° F.) to render it anhydrous. Exposed to the atmosphere it

absorbs water, which recombines. It should, therefore, be kept in close containers.

Uses.—Sulphate of calcium is used in solution as a chemical test. Not used in medicine.

Plaster of Paris, in surgery for making casts and preparing immovable apparatus for fractures.

CALCII SULPHIS, $\text{CaSO}_3 \cdot 2\text{H}_2\text{O}$. M. wt. 156. **Sulphite of Calcium.**

The salt as a white powder, and having a somewhat sulphurous taste.

Solubility.—Slightly soluble in water (800 parts).

Uses.—It possesses properties analogous to the other sulphites, but feebler on account of its insolubility, for which reason it is rarely used internally. As an anti-ferment or anti-septic, used to arrest fermentation in saccharine juices, as cider, etc.

CALCII SULPHIDUM, CaS . M. wt. 72. **Sulphide of Calcium.**

The chemical as a white or grayish-white powder, soluble in cold water (500 parts), insoluble in alcohol, and decomposed by boiling water, or by long contact with cold water, into soluble calcic disulphide and calcic hydrate.

Tests.—*Sulphate of calcium*; insoluble white residue after long boiling in water.

Preparations.—A trituration, as in Sec. 49, Part I.

Uses.—To prevent or arrest suppuration and the formation of pus in local inflammations, or to hasten maturation when pus has already formed, and in furuncular and glandular inflammations, mammary or other abscesses accompanied with great pain.

Dose.—In trituration or pill, $\frac{1}{10}$ gr. = gm. .0066, every three hours. Less for children.

CALENDULA OFFICINALIS. Marigold.

The recent herb in flower.

Compositæ, Cynarææ.

Linné.

Constituents.—*Calendulin*, yellowish, insoluble in ether, soluble in alcohol, and swelling in water to a jelly, and tasteless; an amorphous *bitter principle*, together with the usual constituents common to most plants.

Preparations.—A tincture, $\frac{N}{1}$, with dilute alcohol, as in Sec. 40, Part I.
 A tincture, $\frac{N}{2}$, with dilute alcohol, as in Sec. 43, Part I.
 [Tincture calendulæ, U. S. P. = $\frac{N}{5}$.]

Uses.—Locally, largely diluted with water to lacerated wounds, contusions, and to ulcers to prevent or diminish suppuration; also, well diluted, as an injection in leucorrhœa, vaginal or uterine.

CALLITRICHE VERNA. Water Starwort.

The fresh plant.

Callitrichaceæ.

Linné.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.
 A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—As a diuretic in dropsies.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xx. = gm. 0.66 to 1.33, or equivalent.

CALUMBA. Columbo.

The root of *Jateorrhiza palmata*, or *Cocculus palmatus*.

Menispermæ.

Bentley and Trimen.

Constituents.—*Columbin* ($C_{42}H_{44}O_{14}$), colorless, odorless, soluble in alkalis and acetic acid, partially in alcohol and ether; *columbic acid*, freely soluble in alcohol and alkalis, partly in ether, insoluble in water, and existing in the root with the yellow alkaloid *berberina*; *gum*, *pectin*, *starch*, *resin*, and *wax*.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.
 A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Useful as a remedy to increase the appetite and promote digestion, by removal of relaxed conditions of the gastro-intestinal tract, and increasing secretion of gastric juice. Also in diarrhœa, dysentery, etc.

Dose.—Tincture, $\frac{N}{1}$, gtt. xv. to xx. = gm. 1.00 to 1.33, or equivalent.

CALX, CaO. M. wt. 56. Calcium Oxide. Lime.

Lime made from chalk, marble, or calc-spar by calcination.

Tests.—*Carbonate*; effervescence with acids. *Alumina oxide*, *iron*, etc.; white or reddish precipitate with saccharated solution of lime, when added to a solution in hydrochloric acid.

Preparations.—A solution of calcium hydrate (Ca_2HO), *Liquor Calcis*,

or lime water, specific gravity 1.010, representing 0.13 per cent. of oxide (CaO), prepared as follows:

Take of Fresh lime	<i>A convenient quantity.</i>
Water, <i>sufficient</i>	q. s.

Add the water to the lime until it is fully slacked, and the mixture is of the consistence of cream; allow the mixture to stand for 24 hours in a tightly-stopped bottle, and carefully remove the clear supernatant solution by siphon or decantation.

A saccharated solution, *Liquor Calcii saccharatus*, specific gravity 1.052, containing about 7 grains of lime (CaO) to each fluidounce, or (approximately) 1.5 per cent., prepared as follows:

Take of Fresh lime, <i>one part</i>	1
Sugar, <i>two parts</i>	2
Water, <i>twenty parts</i>	20

Slack the lime with the water, dissolve the sugar in the mixture, and digest with occasional agitation for two hours; allow the undissolved lime to subside, decant the clear liquid, and keep in well-stopped containers. [*Syrupus calcis*, U. S. P. = $\frac{N}{20}$.]

CALX CHLORINATA, $\text{CaCl}_2 \cdot \text{Ca}_2\text{ClO}$. Chlorinated Lime. Bleaching Powder.

The commercial chlorinated lime, composed of a mixture of calcium hypochlorite, chloride, and hydrate, and containing 25 per cent. of available chlorine.

Solubility.—The hypochlorite and chloride dissolve in water and dilute alcohol, the hydrate being but slightly soluble. Chlorinated lime is wholly dissolved by hydrochloric acid, with evolution of chlorine.

Tests.—Solubility as above. Quantitive determination of chlorine.

Uses.—The chlorine of this drug is given off spontaneously through decomposition of the hypochlorous acid, which also yields oxygen. It is, therefore, both a direct and indirect oxydizer. Its chlorine attacks and unites with hydrogen in organic substances, and in water, breaking up their composition and freeing oxygen, which, with that yielded in the decomposition of hypochlorous acid, is available as a deodorizer, antiseptic, and disinfectant. It destroys sulphuretted hydrogen, ammonia, and ammonium sulphide, and for this property is used as a deodorizer of sick rooms. It prevents decomposition of pus, and hence is used in weak solution as a wash to foul-smelling, sloughing sores or abscesses; also, locally, and in ulceration of the mouth and fauces in diphtheria, scarlet fever, aphthæ, etc.; also to disinfect sick rooms after

infectious diseases. Internally, its action accords with its chemical affinities, oxygen being evolved by decomposition, as above. It should be given highly diluted and with caution.

CALYCANTHUS FLORIDUS. Florida Allspice.

The fresh bark of the shrub and its roots.

Calycanthaceæ.

Linné.

Constituents.—Not known.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—In relaxed and catarrhal conditions of the gastro-intestinal mucous membranes, and as an aromatic stimulant to relieve colic and flatulence.

Dose.—Tincture, $\frac{N}{2}$, gtt. v. to xx. = gm. 0.33 to 1.33.

CAMPHORA, $C_{10}H_{16}O$. M. wt. 152. Camphor.

The refined, concrete, volatile substance obtained from the *Camphora officinarum* (*Cinnamomum camphora*, *F. Nees*).

Lauraceæ.

Solubility.—Water dissolves it but slightly (1 in 1300). It is freely soluble in oils, alcohol, ether, chloroform, bisulphide of carbon, acetic and nitric acid.

Tests.—*Fixed salts*; residue on volatilization. It should dissolve without residue in alcohol, and form a colorless liquid.

Preparations.—A tincture, $\frac{N}{10}$, with alcohol, *seven parts*, water, *two parts*, as in Sec. 46, Part I. (Spts. camphor, U. S. P.)

A liniment, $\frac{N}{5}$, as follows:

Take of Camphor, <i>one part</i>	1
Olive or cotton-seed oil, <i>four parts</i>	4

Powder the camphor and dissolve in the oil by the aid of a gentle heat. (U. S. P.)

A medicated water, $\frac{4N}{500}$. Aqua camphora, as follows:

Take of Camphor, <i>four parts</i>	4
Alcohol, <i>four parts</i>	4
Precipitated phosphate of lime	q. s.
Water, sufficient	q. s.

Dissolve the camphor in the alcohol, add phosphate of lime sufficient to make a paste; gradually add, with constant trituration, water sufficient after filtration to make *five hundred* (500) *parts*. (U. S. P.)

Uses.—Internally, in conditions characterized by great coldness of the

surface and extremities, prostration of the vital force, diarrhœa and cramping, oppression of breathing and faintness, in hysterical vomiting and flatulent colic; as a stimulant in typhoid pneumonia, and to quiet delirium of typhoid and typhus fevers. Also in cholera and summer diarrhœa of children. Externally, in liniment, $\frac{N}{5}$, for pains of superficial parts, as in myalgia, lumbago, etc.; also as a topical stimulant when there is want of life in a part from enfeebled circulation.

Dose.—Tincture, $\frac{N}{10}$, gtt. v. to xx. = gm. 0.33 to 1.33 in a suitable vehicle.

CAMPHORA MONOBROMATA, $C_{10}H_{15}BrO$. M. wt. 220.8.
Monobromated Camphor.

The pure chemical in white prisms or scales. It is camphor ($C_{10}H_{16}O$) in which an atom of hydrogen is replaced by one of bromine.

Solubility.—Insoluble in water, soluble in alcohol and oil.

Tests.—As found in commerce, this substance is quite pure. Should be completely dissipated by heat and soluble without alteration in cold concentrated sulphuric acid.

Uses.—Used in full medicinal doses in obstinate hysterical convulsions, infantile convulsions from irritation of teething, headache from anæmia with crethism, extremities cold and circulation feeble. Also recommended in nymphomania, spermatorrhœa, chordee, etc. Usually administered in powder, trituration, or pill.

Dose.—Grs. 1 to 4 = .06 to .25, every hour until relief is obtained.

CANELLA ALBA. Canella.

The dried bark.

Canellaceæ.

Bentley and Trimen. Murray.

Constituents.—*Volatile oil*, which is a mixture of eugenic acid ($C_{10}H_{12}O_2$) with two neutral oxygen-containing oils, one of which has a similar odor to cajuput; *resin*, *bitter principle*, *mucilage*, *albumen*, and *salts*.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.
A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—An aromatic stimulant and tonic in debilitated conditions of the gastric and intestinal mucous surfaces. Usually associated with bitter tonics.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xl. = gm. 0.60 to 2.50, or equivalent.

CANNABIS AMERICANA. American Hemp.

The fresh flowering tops of *C. sativa*, cultivated in North America.

CANNABIS INDICA. India Hemp.

The dried flowering tops of the female plant of *C. sativa*, imported from India, where it is known as *gunjah* or *ganja*.

Urticaceæ, Cannabineæ.

Linné. Bentley and Trimen.

Constituents.—*Cannabine*, a resinous body of warm, acrid, and bitter taste, soluble in alcohol and ether, is the most important constituent. This resinous body, in an impure form, is the *churrus* of India. Cannabis also contains a *volatile oil* composed of a liquid hydrocarbon, *cannabene* ($C_{18}H_{20}$), said to be highly medicinal, and a solid, *cannabene hydride* ($C_{13}H_{22}$). The other constituents are unimportant.

Preparations.—From *C. Americana*, a tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

From *C. Americana*, a tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

From *C. Indica*, a tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

From *C. Indica*, a tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I. [*Tinctura cannabis Indicæ*, U. S. P. = $\frac{N}{5}$.]

From both varieties, an extract with alcohol, as in Sec. 19, Part I.

Uses.—Both varieties of the cannabis possess similar properties, but differing in degree. The *C. Indica* is the most active. Cannabis, in moderate medicinal doses, is a direct stimulant to the cerebrum and cerebro-spinal nerve centres, increasing both motor and sensory activity. Its stimulating action is followed by anæsthesia and loss of muscular sense, with pleasant though dreamful sleep. It lessens the sensibility of the pulmonary, gastro-intestinal, and urinary tracts, and this property, with that of controlling sensory hyperæsthesias of peripheral or psychic origin, points out its most direct remedial uses. It is highly useful in irritations of the genito-urinary tract, as gonorrhœa, dysuria, vesical and renal disorders after the acute stages; also in megrim or sick-headache, when the paroxysms are accompanied by gastric irritation; diarrhœa and cholera morbus from gastro-intestinal irritation; hysteria dysmenorrhœa and uterine hemorrhage, when from purely neurotic excitement; dry, hard coughs from pulmonary irritation.

Dose.—*C. Indica*, tincture, $\frac{N}{I}$, gtt. ij. to x. = gm. 0.13 to 0.66.

C. Indica, extract, grs. $\frac{1}{8}$ to $\frac{1}{2}$ = gm. .01 to .03.

C. Americana, tincture, $\frac{N}{I}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

C. Americana, extract, grs. $\frac{1}{2}$ to ij. = gm. .03 to .13.

CANTHARIS. Spanish Fly.

The dried insect, *Cantharis* (*Lytta*) *vesicatoria*, *De Geer*.
Vesicifica, *Coleoptera*, *Insecta*.

Constituents.—*Cantharidin* ($C_5H_5O_2$), the active blistering principle, is a camphor or stearopton, soluble in alcohol, chloroform, glacial acetic acid, and in acetic ether; insoluble in carbon bisulphide, slightly soluble in water after long digestion; it is fusible and volatile, and crystallizes in mica-like flakes. The other constituents are *resinous* and *fatty matters*, soluble in alcohol, chloroform, and carbon bisulphide, and insoluble in water.

Tests.—Careful examination will determine the presence of other insects than the cantharis, when not powdered. The powdered form is frequently adulterated with powdered gum euphorbium, especially when used in plaster or cerate, and the mixture is difficult to detect. Assay of the per cent. of cantharidin would probably determine the question. The character and violence of its action may cause suspicion.

Preparations.—A tincture, $\frac{N}{20}$, with alcohol, as in Sec. 48, Part I, excepting that 20 *parts* are made from one part of the drug.

A cerate, $\frac{N}{3}$, *Ceratum Cantharidis*, as follows:

Take of Yellow wax, <i>seven parts</i>	. . . . .	7
Resin, <i>seven parts</i>	. . . . .	7
Lard, <i>ten parts</i>	. . . . .	10
Cantharides in very fine powder, <i>twelve parts</i>	. . . . .	12

Melt the wax, resin, and lard by heat of a water-bath, strain through muslin, add the cantharides; keep the mixture liquid for half an hour, stirring occasionally; remove from heat, and stir until cool.

(Equivalent to U. S. P.)

Uses.—Internally, in minute doses, as a stimulant to the mucous tract of the urinary organs, when there is burning, stinging pain, strangury and tenesmus of the neck of the bladder, when the condition is one of hyperæmia with vascular relaxation. Used in cerate as a counter-irritant, carefully guarding against strangury from absorption, and avoiding its use during pregnancy, in infancy, and in acute stages of inflammation.

In poisoning from cantharides, an emetic or stomach-pump should be used, followed by demulcents, but avoiding oil.

Dose.—Tincture, $\frac{N}{20}$, gtt. j. to v. = gm. 0.06 to 0.33 to water 5iv. Teaspoonful doses (gm. 4.00) every one to three hours.

CAPSELLA BURSA PASTORIS. Shepherd's Purse.

The fresh herb. *Thlaspi Bursa-pastoris.* *Linné.*

Cruciferae, Siliculosae, Lepidinæ.

Constituents.—*Soft resin; volatile oil* identical with that of mustard; *fixed oil*, and the ordinary non-medicinal constituents of herbs.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—It directly influences the vascular system of the pelvic viscera, and is used to arrest menstrual hemorrhage with uterine colic, uterine cramps with hemorrhage from miscarriage, hematuria, hemorrhoids, diarrhœa, dysentery, and in renal and cystic diseases when seemingly due to vascular atony.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent.

CAPSICUM. Capsicum Fruit.

The fruits of several species of capsicum, including *C. annum* and *C. fastigiatum.* *Blume.*

Solanaceæ.

Constituents.—*Capsicin* ($C_{19}H_{14}O_2$), which is white, crystallizable, fusible, volatile, and soluble in alcohol, ether, amylic alcohol, fixed oils, and alkalis. It is also associated with fatty and resinous matter of a red color, and with volatile oil. It also contains a *volatile alkaloid*, having the smell of conia, but is not identical with it. The red coloring matter is but partly soluble in boiling alcohol, and dissolves readily in amylic alcohol, ether, chloroform, petroleum, oils, and bisulphide of carbon.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

An oleo-resin, $\frac{4N}{1}$, with alcohol, as in Sec. 25, Part I.

[Tinctura capsici, U. S. P. = $\frac{N}{20}$.]

Uses.—As a local stimulant and irritant to mucous membranes and skin, to improve the capillary circulation in these tissues; also, as a general nerve stimulant, acting reflexly through its influence on the nerve end-organs of the vagi in the stomach. In atonic dyspepsia, especially that of drunkards. As a gargle in sore throats with relaxed tissues bathed with mucus or pus, or in the early states before the deep tissues are involved and the parts swollen. Pains in the region of the kidneys, indicating sluggish capillary circulation, when there is a trace of albumen in the urine, are benefited by its internal use and its local

application over the loins. A useful stimulant substitute to overcome the alcohol habit, to quiet restlessness and induce sleep in delirium tremens, and to antagonize sudden prostration with tendency to congestion.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

CARBO ANIMALIS. Animal Charcoal.

The residue obtained by subjecting dried ox bones to a red heat without access of air.

Constituents.—In addition to the element carbon, it contains about 80 per cent. of *tri-basic phosphate*, with small amounts of *carbonate of calcium*, and traces of *silica*, *iron*, and *potassium* salts.

Carbo Animalis Purificatus, or purified animal charcoal, is the C. animalis which has been digested with its own weight of hydrochloric acid, and thoroughly washed to remove earthy salts. Incinerated with an equal weight of mercuric oxide, it should leave but a minute amount of ash.

CARBO LIGNI. Wood Charcoal.

The odorless, insipid, black residue obtained by subjecting wood to a red heat without access of air. Willow, beech, birch, and maple wood are usually preferred for medicinal charcoal.

Constituents.—85 to 90 per cent. of *carbon*, 1 to 2 per cent. of salts of *potassium* and *sodium*, with traces of *earthy salts* and *silica*, and 10 to 15 per cent. of volatile matters.

Preparations.—Both C. animalis and C. ligni appear in commerce for medicinal purposes in powder, and can only be distinguished when powdered by an examination of the ash obtained by burning off the carbon from a portion. The ash from C. animalis is nearly insoluble, and that from C. ligni soluble in dilute sulphuric acid, the latter forming a bitterish solution.

Uses.—Wood charcoal is preferable to animal charcoal for internal use. In doses of 5 to 10 grains before or after meals, according to the time the difficulty occurs, charcoal will usually relieve intestinal flatulence, allay the pain in chronic gastric ulcer and neuralgia of the stomach, checking fermentation and resulting acidity. Also used to absorb offensive gases emitted from foul ulcers, sloughing and gangrenous wounds, applied by filling a flat muslin bag with the finely granulated charcoal, and applying over a poultice covering the sore. Carbo. veg. is preferable for this purpose. Both forms are extensively used

in pharmacy and the arts, on account of their power of absorbing vegetable coloring matters.

C. animalis is recommended in trituration by homœopathic writers for affections of the lymphatic glandular system, digestive organs, and skin. Its efficacy doubtless depends largely upon phosphate of calcium.

C. veg. Recommended by same authorities in affections of mucous surfaces, characterized by large increase of secretions, especially of the intestinal canal, and usually of an acrid character or very offensive; also, in hemorrhage of an asthenic character, skin pale, circulation feeble, abdomen tumid and doughy. In decimal trituration, $\frac{N}{102}$ to $\frac{N}{106}$; one-grain doses (Sec. 49, Part I.).

CARBONEI BISULPHIDUM, CS₂. M. wt. 76. Carbon Bisulphide.

The very volatile, neutral, colorless, transparent, highly refractive liquid of above composition, specific gravity 1.272 at 15° C. (59° F.), nearly odorless when purified (by digesting with copper turnings), burns with a blue flame, and a mixture of its vapor with atmospheric air is explosive.

Solubility.—Mixes in all proportions with alcohol when anhydrous, its solubility decreasing with the alcoholic strength of the solvent. Readily dissolved by benzol, chloroform, ether, volatile and fixed oils.

Tests.—*Sulphur and other solids*; residue on spontaneous evaporation. *Sulphuretted hydrogen*; fetid odor and dark turbidity, or precipitate on agitation with solution of plumbic acetate. It should not change moist litmus paper.

Uses.—Mainly used for its remarkable solvent powers. It freely dissolves iodine, bromine, phosphorus, sulphur, camphor, caoutchouc, gutta-percha, wax, many resins, paraffine, stearin, iodoform, chloral hydrate, fixed and volatile oils, fats, many alkaloids, as aconitia, atropia, codeia, conia, nicotia, quinia, quinidia, quinoidine, veratria, and in general all alkaloids soluble in ether.

Inhaled, it is a powerful anæsthetic, rapid in its effects, but very transient, and followed in most cases by disagreeable and dangerous symptoms. Locally, it produces irritation and redness, and is used to relieve superficial pains by exposing the affected part to its vapor. Mixed with oil or alcohol, with or without camphor or essential oils, it is used as a stimulating liniment in gouty and rheumatic affections, and as a resolvent in goitre and glandular swellings.

Internally, in doses of gtt. ij. to v. = gm. 0.13 to 0.33, dissolved in

oil or alcohol, mixed with milk or dropped on sugar, it is a diffusible stimulant similar to ether, augmenting the heart's action, increasing arterial pressure and action of the skin.

Used in hysterical fits and fainting when above action is needed.

CARBONEI TETRACHLORIDUM, CCl_4 . M. wt. 154.

Tetrachloride of Carbon. Chlorocarbon.

A colorless, thin, oily liquid, of an agreeable, aromatic odor, specific gravity 1.599, and boils at 78°C . (172.4°F).

Solubility.—Insoluble in water, soluble in alcohol and ether.

Uses.—A prompt anæsthetic, which has been used to relieve neuralgia and various local pains. Its primary action is upon the heart, for which reason it is very unsafe, and should never be employed internally.

CARDAMINE. Cuckoo Flower.

The fresh plant of *C. pratensis*, *C. amara*, and *C. hirsuta*.

Cruciferae, Siliquosae.

Linné.

Constituents.—These plants, which possess a pungent and more or less bitter taste, are said to contain *myrosin*, but no myronic acid. In the *C. amara*, however, is found an acid containing sulphur and nitrogen, which yields with myrosin a volatile oil similar to that of mustard.

Uses.—These plants, which resemble the cress family in their pungent taste, are occasionally used as salads, and are reputed to possess diuretic and expectorant virtues. They are rarely used.

CARDAMOMUM. Malabâr Cardamoms.

The seeds and pericarpial coats of *Elettaria cardamomum*.

Zingiberaceae.

Maton. Bentley and Trimen.

Constituents.—4.5 per cent. of an aromatic, pungent, *volatile* oil ($\text{C}_{10}\text{H}_{16}$), isomeric with oil of turpentine, and of specific gravity 0.945, and a *camphor* resembling turpentine camphor ($\text{C}_{10}\text{H}_{16}\text{O}$), both soluble in alcohol; *fixed oil*, *coloring matter*, and other unimportant ingredients, insoluble in alcohol.

Preparations.—A tincture, $\frac{\text{N}}{\text{v}}$, with alcohol, as in Sec. 43, Part I.

[Tinct. cardamom, U. S. P. = $\frac{15\text{N}}{100}$.]

[Tinct. cardamom comp., U. S. P., represents in each 250 parts, cardamom, 5 parts, carui, $2\frac{1}{4}$ parts, cinnamon, 5 parts, with glycerine, coloring matters, and diluted alcohol.]

Uses.—As an agreeable aromatic carminative and flavoring addition for other medicines.

Dose.—Tincture, $\frac{N}{2}$, gtt. x. to xx. = gm. 0.66 to 1.33.

CARDUUS BENEDICTUS. Blessed Thistle.

The fresh leaves and flowering tops of *Cnicus benedictus* s. *Centaurea benedicta*.

Compositæ, Cyanarææ.

Linné.

Constituents.—*Cnicin*, which, when pure, is colorless, crystallizable, soluble in alcohol, slightly soluble in cold water and ether, dissolves in, and is colored green by hydrochloric acid, red by sulphuric acid.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 43, Part I.

Uses.—It has been used in warm infusion to induce diaphoresis. In large doses it nauseates. Its principal value is in gastric atony attended with hepatic congestion.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xxx. = gm. 0.33 to 2.00, or equivalent.

CARICA PAPAYA. Pawpaw Tree.

Passifloreæ.

Botanic Register.

Constituents.—The milk of the unripe fruit and the juice from the bark and leaves, which exist in small amount, have been specially examined. The fresh milky juice of the fruit is strongly acid and readily gelatinizes, even when mixed with several volumes of water. It is without odor, astringent, and somewhat bitter, and contains a peculiar principle called *papayotin* or *caricine*, which is freely soluble in water and glycerine, insoluble in alcohol, ether, and fatty oils; when pure it is amorphous, snow-white, odorless, and almost tasteless.

The seeds of the fruit contain a *resinous acid*, yellowish in color when in powder, and of pungent taste.

Preparations.—The most reliable preparation is a glycerite made by collecting the milky juice directly into glycerine, which prevents its rapid gelatinization and preserves its principles in full activity.

Caricine, if properly prepared, would also be reliable.

Uses.—It is claimed that the active principle of the milky juice of this drug is a true vegetable pepsin or digestive ferment, capable of dissolving albuminoid substances and converting them into true peptones. It is also said to be effective against lumbricoides, even after

boiling, and that the seeds possess an identical property. The real value of the drug may properly be considered as yet unsettled.

CAROTA. Wild Carrot Seed.

The fruit, commonly called seed, of the wild variety of *Daucus carota*.

Umbelliferæ.

Linné. Bentley and Trimen.

Constituents.—A *volatile oil*, soluble in alcohol and ether.

Preparations.—A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—In suppression of urine and painful micturition, and as an aromatic stimulant and carminative.

Dose.—Tincture, $\frac{N}{2}$, gtt. v. to xx. = gm. 0.33 to 1.33.

CARTHAMUS TINCTORIA. American Saffron.

The reddish-yellow florets.

Compositæ.

Linné.

Constituents.—A *red-coloring* matter of a resinous nature ($C_{14}H_8O_7$), soluble in alcohol, slightly in water, insoluble in ether; *yellow coloring matter*; *salts of potassium*, and other constituents of no importance.

Uses.—Used as a coloring agent, and in hot infusion (Sec. 23, Part I.), as a substitute for Spanish saffron, to promote eruption in measles, scarlatina, etc. Of doubtful value.

Dose.—Of the infusion, $\frac{N}{10}$, *ad lib.*

CARUM CARUI. Caraway.

The mericarps, commonly called seeds.

Umbelliferæ, Orthospermæ.

Linné.

Constituents.—An essential oil, *Ol. Cari*, specific gravity .91 to .97, according to age, composed of two bodies, carvol ($C_{10}H_{14}O$), which is thin and colorless, and carvene ($C_{10}H_{16}$), a camphor-like body. The oil is neutral, readily soluble in alcohol, colorless or yellow, and thickens by age. Other constituents are not important.

Preparations.—A medicated water, $\frac{N}{50}$, from the oil, as in Sec. 15, *a*, Part I.

A tincture, $\frac{N}{50}$, from the oil with alcohol, as follows:

Take of <i>Ol. cari</i> , two parts	2
Alcohol, ninety-eight parts	98

Dissolve the oil with the alcohol.

Uses.—In substance, rarely used except in cooking, as a flavor.

The oil, or its solutions as above, is occasionally used to relieve flatulence of children, and to cover the taste and prevent griping of other medicines.

Dose.—Ol. carui, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

CARYOPHYLLUS. Cloves.

The unexpanded flower of *Caryophyllus aromaticus*. (*Eugenia caryophyllata*, *Thunberg*.)

Myrtaceæ.

Linné. Bentley and Trimen.

Constituents.—*Oil of cloves*, soluble in alcohol, concentrated acetic acid, ether, and fixed oils; colorless when fresh, reddish-brown after keeping; insoluble in, and heavier than, water; specific gravity 1.034 to 1.060, and containing a liquid hydrocarbon ($C_{20}H_{32}$), two isomeric bodies, eugenic acid ($C_{10}H_{12}O_2$), and eugenin, caryophyllin ($C_{10}H_{16}O$), a camphor-like substance and a salicylic compound. In addition to the oil, cloves contain an almost tasteless *resin*, *tannin*, *gum*, *woody fibre*, and water.

Uses.—As a spice or condiment in food. The oil, on which the activity of the drug depends, is used in small quantities as a diffusible stimulant, and as an adjunct to other medicines to improve their flavor, or prevent griping of purgatives. Locally, pure or dissolved, to ease the pain of toothache, and as a stimulating application in superficial neuralgic pains; also as an efficient deodorizer of sponge tents, and an antiseptic to prevent putrid fermentation of secretions of axillæ, feet, etc.

Dose.—Of the oil, gtt. j. to v. = gm. 0.06 to 0.33.

Of the powdered cloves, grs. v. to xv. = gm. 0.33 to 1.00.

CASCARILLA. Cascarilla.

The bark of *Croton eleuteria*.

Euphorbiaceæ.

Bennett. Bentley and Trimen.

Constituents.—*Volatile oil*, having the odor and taste of the bark; *resin*, a crystalline principle *cascarilline*, and *tannin*; all soluble in alcohol.

Preparations.—A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—As a warming, aromatic stimulant and tonic in debility from fevers, dysentery, and in gastric and bronchial catarrh to check excessive secretion.

Dose.—Of powdered bark, grs. x. to xxx. = gm. 0.66 to 2.00, in substance, infusion or tincture.

CASSIA FISTULA. Purging Cassia.

The dried pods of the tree or purging cassia.

Leguminosæ, Cæsalpinieæ.

Linné. Bentley and Trimen.

Preparations.—The pulp, in which is contained the active medicinal virtues of the drug, is separated by macerating the pods with water sufficient to cover them, straining the softened pulp through a hair sieve to separate seeds and impurities, and evaporating on a water-bath to such a consistence that it will not run when cold.

Uses.—In doses of ʒj. to ʒij., as a laxative. Rarely used alone. Of interest only as a constituent of confection sennæ, U. S. P., which contains 16 per cent. of purging cassia, 10 per cent. of powdered senna, with pulp of prunes, figs, and tamarinds, 6 per cent. of coriander, balance sugar and moisture.

CASSIA MARILANDICA. American Senna.

The dried leaves.

Leguminosæ.

Linné. Bentley and Trimen.

Constituents.—The active constituent is *cathartic acid*, which is found also in imported senna. It is a glucoside, is associated with salts of potassium and calcium, and is probably combined with one of these bases. The cathartates as found in the drug are insoluble in alcohol, soluble in water. Water is, therefore, its best solvent.

Uses.—As a substitute for the imported senna. May be administered in same forms in rather larger doses, as its activity is less. See *Senna*.

CASTANEA VESCA. Chestnut Leaves.

The dried leaves of the tree bearing the common edible chestnut.

Cupuliferæ.

Linné.

Constituents.—Has not been accurately analyzed. *Tannin* and *mucilaginous matters* are the constituents upon which its virtues most probably depend. The former soluble, the latter insoluble, in alcohol.

Uses.—To control paroxysm of whooping-cough. Tannin, used locally to the pharynx, epiglottis, and adjacent tissues, possesses this power, and the castanea probably acts in a similar manner, its tannin being assisted by its mucilage in quieting the reflex cough.

The commercial fluid extract made by digesting the leaves in water, adding glycerine, 4 fluidounces, sugar, 7 troyounces, and evaporating

until each fluidounce represents a troyounce of leaves, is convenient for administration.

CASTOREUM. Castor.

The dried drug, *i. e.*, the preputial follicles and their secretion obtained from the beaver, *Castor fiber*.

Mammalia, Rodentia.

Constituents.—A *resin*, insoluble in water and ether, soluble in alcohol and of bitter taste; a crystalline substance, *castorin*, soluble in alcohol, ether, olive oil, and turpentine, and slowly volatilizing from hot water.

Preparations.—A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 47, Part I.

Uses.—A remedy, whose real utility is not well defined. Through the cerebro-spinal nervous system, it seems to influence directly and especially the uterus and diseased conditions arising from reflex sympathy therewith. It is recommended in amenorrhœa, leucorrhœa, suppression of the lochia, the vomiting of pregnancy, and especially in spasmodic uterine pains, with painful tympanitic swellings of the bowels, hysterical spasms, and in the twitchings and tremblings of adynamic febrile diseases.

Dose.—Gtt. j. to ʒj. = gm. 0.06 to 4.00.

CATALPA BIGNONIoidES. Catalpa.

The recent bark. The fresh flowers.

Bignoniaceæ.

Linné.

Constituents.—The bark contains *tannin* and an *amorphous bitter principle*, soluble in alcohol, ether, and chloroform; *sugar* and a *resin* having no taste were found.

Preparations.—The following are suggested for trial:

A tincture, $\frac{N}{2}$, of the bark, as in Sec. 45, Part I.

A tincture, $\frac{N}{10}$, of the flowers, as in Sec. 47, Part I.

Uses.—These are not well defined. The bark has been used as an anthelmintic and as an alterative, which will suggest the line of study. The flowers are suggested as a possible remedy of value in nervous asthma and bronchial difficulties.

Dose.—Tincture, $\frac{N}{2}$, of the bark, gtt. j. to x. = gm. 0.06 to 0.66.

CATECHU PALLIDUM. Pale Catechu.

The extract of the leaves and shoots of *Uncaria gambier*, and known in commerce as gambier and terra japonica.

Rubiaceæ, Naucleæ.

Bentley and Trimen.

Constituents.—*Catechu-tannic acid*; soluble in cold water, precipitating ferric salts (olive brown) and gelatin (a grayish color). *Catechin* or *catechuic acid* ($C_{13}H_{12}O_5$), which, when pure, forms white, silky needles, soluble in alcohol, ether, and boiling water, but simply swells in cold water; has a sweetish taste, imparts a green color to most ferric salts, and precipitates most metallic salts, but does not affect gelatin or tartar emetic. *Quercitrin* and *quinovic acid*.

Common catechu, or euteh, obtained from the *Acacia catechu* (*Leguminosæ*, *Mimosæ*), trees native of Ceylon and the East Indies, contains the same constituents, and is used for the same purpose, but usually is more astringent. (Catechu, U. S. P.)

Preparations.—A tincture, $\frac{N}{5}$, with diluted alcohol, as in Sec. 48, Part I.

Uses.—A simple astringent to restrain excessive discharges or hemorrhage from the mucous surfaces, and to correct relaxation and flaccidity of the same. (See *Tannic Acid*.)

Dose.—Grs. j. to xxx. = gms. 0.06 to 2.00, in powder, or equivalent in tincture.

CAULOPHYLLUM THALICTROIDES. Blue Cohosh.

The rhizome recently gathered.

Berberidaceæ.

Miehaux.

Constituents.—*Two resins*; soluble in alcohol, insoluble in water. *Saponin*; soluble in alcohol. *Gum, starch*, etc.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

Uses.—Used to cause intermittent contractions of the gravid uterus, when the pains lack vigor and regularity during labor, or when they have ceased from exhaustion; also, in spasmodic after-pains, false pains, dysmenorrhœa, and the pains in the uterus from cold, rheumatism, threatened miscarriage, or premature labor.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

CEANOTHUS AMERICANUS. Red Root.

The recently dried root, sometimes called Jersey Tea.

Rhamnaceæ.

Linné.

Constituents.—*Tannin* is the only medicinal principle that has been recognized as present. The root has not been analyzed.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—The claim is made that this remedy directly influences the spleen, and is curative of splenitis or enlargement of the spleen. A tincture of the leaves was used internally and locally. It may be prepared as in Secs. 40 and 43, Part I., as with the root. The root possesses astringent properties, and may be employed in profuse secretion from bronchial and pulmonary surfaces, which it seems to influence; also in catarrhal conditions of mucous membranes in the absence of inflammation.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xxx. = gm. 0.06 to 2.00, or equivalent.

CEDRON. Cedron Seed.

The dried and powdered seeds of *Simaba cedron*.

Simarubææ.

Constituents.—No analysis has been published.

Preparations.—A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I.

A trituration, $\frac{N}{10}$, as in Sec. 49, Part I.

These correspond with preparations used in homœopathic practice, variously diluted.

Uses.—This drug, which is considered an antidote for the bites of venomous reptiles by the natives of South America, is but little used except by homœopathic physicians. It is a cerebro-spinal stimulant, exerting a beneficial effect in intermittents characterized by marked periodicity, great severity of the chills, numbness or crampy pains in the limbs, pain in kidneys with high-colored urine, great cerebral fullness and headache.

Dose.—Tincture, $\frac{N}{5}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

CELASTRUS SCANDENS. False Bittersweet.

The fresh bark of the root.

Celastraceæ.

Linné.

Constituents.—Not known.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Not well determined. It has proven useful in cutaneous diseases and glandular inactivity, and seems to possess the properties usually termed "alterative" to a marked degree.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xxx. = gm. 0.33 to 2.00, or equivalent.

CEPHALANTHUS OCCIDENTALIS. Button-bush.

The fresh bark.

Rubiaceæ, Cinchonææ.

Linné.

Constituents.—An amorphous *bitter principle*, a substance analogous to *saponin*, *tannin*, all soluble in alcohol and water; *two resins*, soluble in alcohol, insoluble in water, and a crystallizable *fluorescent substance*, soluble in alcohol, water, and ether.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Not well defined. Recommended as an alterative, and as a remedy in coughs.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

CERA ALBA. White Wax.

Beeswax bleached by exposure to moisture, air, and sunlight, of specific gravity 0.97, and fusing near 64° C. (147° F.)

CERA FLAVA. Yellow Wax.

Beeswax prepared from the honeycomb of the honey bee, *Apis mellifica*, fusing at between 62° and 63° C. (145° F.), of specific gravity .965, and dissolving partly in hot alcohol, wholly in turpentine and ether at 15° C. (59° F.)

Constituents.—Yellow wax contains *coloring matters* of a variable character, which are destroyed by bleaching, and are partly dissolved by alcohol; a small amount of *cerolein*, a fat-like substance, soluble in alcohol; *cerin* or *cerotic acid* ($\text{HC}_{27}\text{H}_{53}\text{O}_2$), which is crystalline, fuses at 81° C. (177.8° F.), and is soluble in alcohol. The residue after treatment with boiling alcohol, is *myricin*, or melissyl palmitate ($\text{C}_{30}\text{H}_{61}\cdot\text{C}_{16}\text{H}_{31}\text{O}_2$), which, when pure, forms feathery crystals fusing at 72° C. (161.6° F.)

Tests.—*Earth-wax* (ozokerite or ceresin) and *paraffine* may be detected by boiling with concentrated sulphuric acid, which leaves the substances mentioned unaffected, but destroys the wax; or by treatment with petroleum benzine, which dissolves paraffine and stearine if present, and leaves the wax; or by using cold alcohol, which will dissolve resins and fat acids, but does not affect the wax.

Uses.—Wax is used as a protective, either as a constituent of cerates, or by spreading it on fabrics for the preparation of impermeable tissues.

CERCIS CANADENSIS. Red Bud.

The fresh bark of the root.

Leguminosæ.

Linné.

Constituents.—Not known.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—As an astringent in catarrhal conditions of the digestive tract, and in diarrhœa and dysentery when there is a relaxed condition of the secreting surfaces.

Locally, in infusion or decoction, in chronic mucous profluvia, as leucorrhœa, gleet, conjunctivitis, etc.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent.

CERII OXALAS, $CeC_2O_4 \cdot 3H_2O$. M. wt. 234. Oxalate of Cerium.

The pure chemical in white, somewhat granular, tasteless, and odorless powder.

Solubility.—Insoluble in glycerine, water, alcohol, ether, or chloroform. It dissolves in sulphuric and hydrochloric acids.

Tests.—*Carbonates*; effervescence with hydrochloric acid. *Heavy metals*; precipitates with sulphuretted hydrogen from solution of the salt. *Aluminium salts*; flocculent white precipitate on adding ammonium chloride to a filtered solution of the oxalate in boiling liquor potassæ. *Earthy oxalates*; calcine at a red heat; effervescence of the residue with hydrochloric acid indicates earthy oxalates.

Uses.—Used in cases of obstinate chronic vomiting, especially vomiting of pregnancy. Doses of gr. ss. to j. = gm. 0.03 to 0.06, twice daily, it is claimed will control the severity of whooping-cough and cut short its course.

Dose.—Grs. j. to v. = gm. 0.06 to 0.33, three times per day.

CETACEUM. Spermaceti.

The substance obtained from the head of the sperm whale, *Physeter macrocephalus*, Linné, purified for use; specific gravity 0.943. It is white, translucent, semi-crystalline in appearance, and has a somewhat fatty odor and taste. It melts at 45° C. (113° F.), and is mainly composed of *cetyl palmitate* ($C_{16}H_{33} \cdot C_{16}H_{31}O_2$), or *cetine* with small amounts of fat acids.

Solubility.—Soluble in boiling alcohol, in cold ether, chloroform, volatile and fixed oils.

Tests.—*Fats* cause loss of pearly lustre when mixed with spermaceti, and rancidity occurs from change in the sperm oil often left in it. This latter difficulty can be remedied by boiling it with weak solution of potassium hydrate, and afterward with water.

Preparations.—A cerate, *Ceratum Cetacci*, as follows :

Take of Spermaceti, <i>ten parts</i>	. . . . .	10
White wax, <i>thirty-five parts</i>	. . . . .	35
Olive oil, <i>fifty-five parts</i>	. . . . .	55

Melt the wax and spermaceti, add the oil previously warmed and stir constantly until cool.

Uses.—Used occasionally in powder made by trituration of the melted spermaceti until cold, and admixture with sugar, as a protective to allay the irritation of sore throats, and also the irritation of the urinary and intestinal tracts.

Spermaceti cerate forms a bland, simple dressing for abrasions and ulcers.

CETRARIA. Iceland Moss.

The dried lichen, *Cetraria islandica*. Acharius.

Lichens.

Lichen islandicus. Linné.

Constituents.—*Lichenine* or *lichen starch* ($C_{12}H_{20}O_{10}$), soluble in hot water, but forming a jelly with cold, between 70 and 80 per cent. ; *cetraric acid* or *cetrarin* ($C_{18}H_{16}O_8$) in small amount, and which is white, crystalline, and bitter, insoluble in cold water, slightly in hot water, and in alcohol and ether, but is readily dissolved by alkaline solutions ; a little *gum, sugar*, and other substances of minor importance.

Preparations and Uses.—By macerating *three parts* of Iceland moss for three hours in *ninety parts* of tepid water, to which has been added *one part* of potassium carbonate, and afterward well washing with cold water, the bitterness is removed. By adding to this washed moss, *one hundred parts* of water, boiling until dissolved, straining and adding *three parts* of sugar, and then evaporating to *ten parts*, a jelly is obtained. Thus prepared, it forms a useful, easily digested food for invalids suffering from gastric disorders or from chronic dysentery. Decoctions of Iceland moss are also used in respiratory affections, such as bronchial catarrh and in phthisis.

CHAMÆLERIUM LUTEUM. Unicorn Root.

The rhizome of above known in commerce as the *Helonias dioica* (Pursh).

Melanthaceæ.

Gray.

Constituents.—*Chamælirin*, a yellowish glucoside, soluble in water and alcohol, and of a very bitter taste, is the only medicinal constituent.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

Uses.—A remedy which exerts a direct influence on the uterus, and is of especial value in conditions of atony and loss of normal tone of that organ and its associated viscera. Useful in displacements, in sterility from uterine atony, in amenorrhœa, leucorrhœa, and menorrhagia, due to a lax and anæmic habit. In addition to the special influence, it increases digestion and promotes assimilation, and thus improves the general health.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

CHELEDONIUM MAJUS. Celandine.

The fresh root.

Papaveraceæ.

Linné.

Constituents.—An alkaloid, *cheledonina* ($C_{19}H_{17}N_3O_3$), of a bitter, afterward acrid taste, insoluble in water, and nearly so in ether and alcohol; with acids it forms salts which are bitter in taste. *Chelerythrina*, an alkaloid, identical with sanguinarina ($C_{19}H_{17}NO_4$), soluble in ether, alcohol, fixed and volatile oils. *Chelidoxanthin*, crystallizing in yellow needles, of bitter taste, insoluble in ether, slightly soluble in alcohol, and freely so in hot water, has also been isolated. The alkaloids are combined with *chelidonic* and *malic* acids in the root.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—In derangements of the hepatic system, indicated by more or less pain under the lower angle of the right shoulder-blade; jaundice, stools slimy and light colored or scybalous, bloating in region of liver, with pains on pressure; loathing of food and high colored urine.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent; in water, \mathfrak{z} iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

CHELONE GLABRA. Balmoney.

The fresh herb.

Scrophulariaceæ.

Linné.

Constituents.—No thorough analysis has been made. It contains a *bitter principle* soluble in alcohol and water, and the ordinary constituents common to all herbs.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

Uses.—In weak digestion from gastric atony, jaundice with loss of appetite, constipation and debility, and in chronic intermittents after abuse of quinine.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent, three times a day.

CHENOPODIUM ANTHELMINTICUM. Wormseed.

The fruit, commonly called seed.

Chenopodiaceæ.

Gray. Bentley and Trimen.

Constituents.—The virtues of the seeds are due to a volatile oil, *Ol. Chenopodii*, which is a mixture of a hydrocarbon ($C_{10}H_{16}$), and a liquid-oxidized oil ($C_{10}H_{16}O$). The specific gravity of the oil varies from .902 to .960, according to age, which thickens it if exposed; when fresh, it is colorless or light yellow. The other constituents of wormseed, if any, have not been examined.

Preparations.—A tincture, $\frac{N}{1}$, from the seeds with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, from the seeds with alcohol, as in Sec. 43, Part I.

The oil prepared by distillation with water.

Uses.—The oil is popularly employed as a remedy for lumbricoid worms, and the seeds or their tincture may be used for the same purpose. The latter is often efficacious in relieving the symptoms usually ascribed to the presence of worms, but really caused by a catarrhal condition of the gastro-intestinal mucous membranes, with the imperfect digestion due thereto. Nervous affections arising from reflex impressions originating in the alimentary canal, come under its curative influence.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or *Ol. Chenopodii*, gtt. v. to x. = gm. 0.33 to 0.66, on sugar. Repeat three times per day, several successive days, and follow with a purgative, if given for worms. Smaller doses for the condition of the intestinal canal above alluded to.

CHIANANTHUS VIRGINICA. Fringe Tree.

The fresh bark.

Oleaceæ, Oleinææ.

Gray.

Constituents.—No satisfactory analysis has been published.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—In jaundice and in hepatic engorgement, obstruction or hypertrophy, fulness and pain, often intense, in the region of the liver, extending to the umbilicus, and accompanied with prostration and sometimes nausea.

Dose.—Tincture, $\frac{N}{1}$, gtt. ii. to x. = gm. 0.12 to 0.66, or equivalent.

CHIMAPHILA UMBELLATA. Pipsissewa.

The fresh plant at time of flowering.

Ericaceæ, Pyroleæ.

Nuttall. Bentley and Trimen.

Constituents.—A bitter, neutral glucoside, *arbutine* ($C_{24}H_{32}O_{14} \cdot H_2O$), *tannin*, and a peculiar body, *chimaphillin*, obtained in the form of golden-yellow crystals, condensed in the neck of the retort on distilling the stems with water; it is odorless, tasteless, soluble in alcohol, chloroform, ether, fixed and volatile oils, and insoluble in water. The plant also contains the usual widely distributed non-medicinal principles.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—In chronic renal and vesical affections, when the urine is scanty and loaded with a muco-purulent sediment, and there is vesical tenesmus and frequent urination, with smarting, pressing pain, ropy, sometimes bloody, urine.

Dose.—Tincture, $\frac{N}{1}$, ʒj. to ʒij. = gm. 4.00 to 8.00, or equivalent, in warm water.

CHIOCOCCA RACEMOSA. Cahinca.

The root.

Rubiaceæ, Coffeineæ.

Jaquin.

Constituents.—*Cahincin* or *cahincic acid* ($C_{40}H_{64}O_{18}$), partly free and partly combined with calcium, soluble in hot water, ether, alcohol, and in cold water (600 parts).

Uses.—In decoction, as a diuretic in dropsy, and in substance (gm. j. = grs. $15\frac{1}{2}$), mixed with syrup and gum to form an electuary, as a laxative.

CHIRATA. Chiretta.

The entire dried plant of *Agathotes chirayta*. (*Ophelia chirata*, *Grisebach.*)

Gentianaceæ.

Don. Bentley and Trimen.

Constituents.—An amorphous yellow body, *ophelic acid* ($C_{13}H_{20}O_{10}$), soluble in water, alcohol, and ether, and of an intensely acid taste; *chiratin* ($C_{26}H_{48}O_{15}$), a pale-yellow powder, soluble in alcohol and ether, partly in water, and very bitter. *Tannin* is present in small amount only, and also a *wax-like* substance.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

[Tinctura chiratæ, U. S. P. = $\frac{N}{10}$.]

Uses.—Similar to those of gentian and other simple bitters (which see). Owing to its freedom from tannin, it may be given with iron solutions when desired.

Dose.—Tincture, $\frac{N}{I}$, gtt. x. to xx. = gm. 0.66 to 1.33, or equivalent.

CHLORAL HYDRAS, $C_2HCl_3O.H_2O$. M. wt. 165.5.

Hydrous Chloral. Chloral, U. S. P.

The pure chemical in transparent; colorless, rhomboidal crystals. Its solution in alcohol, specific gravity 0.830, should not redden previously moistened blue litmus paper. It melts at between 56° and $58^\circ C.$ (133° to $136^\circ F.$), and congeals at 45° to $50^\circ C.$ (115° to $120^\circ F.$). It boils at or near $95^\circ C.$ ($203^\circ F.$), and volatilizes without residue; with alkaline solutions it decomposes into chloroform and formate of the alkali.

Chemically, hydrous chloral is a combination of one molecule of water with one of chloral (C_2HCl_3O), which is aldehyd (C_2H_4O) from alcohol (C_2H_6O), with three atoms of its hydrogen replaced by chlorine; hence, chloral is called chemically trichloraldehyd, and its combination with water hydrous chloral. The term hydrate of chloral is a misnomer.

Solubility.—Soluble in water, alcohol, ether, glycerine, benzene, chloroform, bisulphide of carbon, benzol, fixed and volatile oils.

Tests.—*Chloral alcoholate*; combustion on heating on a piece of platinum foil, or separation of microscopic crystals of iodoform on warming with slight excess of solution of potash, and adding iodine as long as it dissolves without coloring the solution. *Decomposition begun*; acidulate a dilute and cold aqueous solution with sulphuric acid, and faintly tinge it with a solution of permanganate of potassium; if the color is discharged in less than two or more hours, decomposition has begun, or it is shown by a white precipitate on adding a solution of nitrate of silver. *Organic impurities*; brown color on warming with sulphuric acid.

Pure sodium hydrate decomposes 4.1375 times its weight of pure hydrous chloral, and yields 72.2 per cent. of the weight of the latter of pure chloroform.

Uses.—Useful in insomnia from mental overwork, anxiety, or from great fatigue; respiratory neuroses, as spasmodic asthma, difficult breathing of emphysema, and in whooping-cough; puerperal and infantile convulsions from reflex irritation; irregular pains of first stage of labor and in after-pains. Locally, as an antiseptic to foul ulcers, wounds, etc.

Triturated with camphor equal parts, as an anti-neuralgic combination for local use; oily and alcoholic solutions may be added to it. Alkaloids, such as veratria, morphia, etc., dissolve in solution of hydrous chloral in glycerine.

Dose.—Internally, hydrous chloral may be administered in the proportion of 1 grain for each year of age up to 20, dissolved in some syrup or in aq. menth. pip. to mask its disagreeable taste.

It may be given to relieve sick-headache by enema, in form of an emulsion made by rubbing the solution with yolk of egg, and mixing with milk.

It may also be used in form of suppository, and, locally, dissolved in oil, ointment, or cerate.

CHLOROFORMUM, CHCl_3 . M. wt. 119.5. Medicinal Chloroform.

The chemically pure chloroform, free from water, specific gravity 1.50, reduced with alcohol to specific gravity 1.480. This prevents decomposition, which rapidly takes place with the pure chloroform when exposed to the light. Chloroform mixes in all proportions with absolute alcohol, ether, carbon-bisulphide, benzol, fixed and volatile oils. It dissolves iodine, bromine, most alkaloids and resins, gutta-percha, caoutchouc, paraffine, camphor, chloral, etc. It dissolves about 1 per cent. of water. Is insoluble in glycerine and mineral acids.

Tests.—*More alcohol than above indicated*; specific gravity less than 1.48; turbidity when mixed with oil of sweet almonds, with which it should make a clear solution. *Incipient decomposition*; white fumes on dropping a few drops of the chloroform into a bottle previously rinsed with a little aqua ammoniæ, or decoloration or redness of water which has been slightly blued with neutral litmus solution, and shaken with an equal volume of chloroform. *Chlorine and hydrochloric acid*; acid reaction with litmus, and white precipitate when two volumes are shaken with one volume of water containing a few drops of solution of nitrate of silver. *Hydrocarbons*; coloration

of one or both liquids on shaking together in a clean glass-stoppered bottle, equal bulks of chloroform and pure sulphuric acid, and leaving them in contact 24 hours. Chloroform that will not bear this test is unfit for inhalation.

Preparations.—*Linimentum Chloroformi.*

Take of Chloroform, <i>three parts</i>	.	.	.	.	.	.	3
Cotton-seed oil, <i>four parts</i>	.	.	.	.	.	.	4

Mix.

[Camphor or soap liniment is sometimes substituted for the oil, as in that of the U. S. P., which contains commercial chloroform, 4 parts, soap liniment, 6 parts.]

Mistura Chloroformi (as in U. S. P.):

Take of Chloroform, <i>eight parts</i>	.	.	.	.	.	.	8
Camphor, <i>two parts</i>	.	.	.	.	.	.	2
Yolk of egg, <i>ten parts</i>	.	.	.	.	.	.	10
Water, <i>eighty parts</i>	.	.	.	.	.	.	80

Rub the yolk of an egg in a mortar with the camphor previously dissolved in the chloroform, then add the water gradually and with constant stirring.

A tincture, $\frac{N}{10}$ (equivalent to sp. chloroform, U. S. P.), with alcohol, as in Sec. 46, Part I.

Chloroform with Amyl Nitrite.—Add 1 part amyl nitrite to each 64 parts of chloroform (2 drachms to each pound).

Uses.—As an anæsthetic in severe convulsive diseases and in surgery, by inhalation from a napkin folded into a cone or funnel shape, and held so as to admit a plentiful admixture of air. The patient should always be in a recumbent position. The degree of narcotism should depend upon the severity of the operation, and should be gradually induced, and profound in the severest cases only. Watch respiration, which must be regular and free, and pulse, which should remain normal in strength and rate. Symptoms of failure in either should suspend the administration, the head should be lowered, using artificial respiration if required. Internally in mixture or tincture in biliary, renal, uterine and flatulent colic, in severe and protracted chills, and in nervous or hysterical paroxysms. Locally, in liniment with or without camphor, tr. aconite, etc., to produce local anæsthesia.

Dose.—Internally, gtt. j. to xv. = gm. 0.06 to 1.00, in tincture or mixture.

CHONDRUS. *Irish Moss.*

The entire dried plant, *Chondrus crispus*.

Algæ. Floridæ.

Greville.

Constituents.—90 per cent. of *mucilage*, about 9.5 per cent. of which dissolves in cold water. The mucilage contains nitrogen and is slightly nutritious. It differs from ordinary gum in some respects, and has been called carrageenin by way of distinction from other mucilaginous substances. It also contains iodine and bromine in traces, and chlorides, sulphates, phosphates, etc.

Preparations.—Usually used in decoction, flavored and sweetened to taste. A jelly may be prepared by boiling *one part* of Irish moss in *forty parts* of water for half an hour, expressing, adding sugar, *two parts*, and boiling until reduced to *ten parts*. Milk may be added to make it more nutritious.

Uses.—In pulmonary, bronchial, and intestinal irritations, and in irritable conditions of the kidney and bladder.

Nutritive and protective, but probably of little real medicinal value.

Dose.—In above forms, ad libitum.

CICUTA VIROSA. Water Hemlock.

The fresh root gathered when the plant is in flower.

Umbelliferæ, Orthospermæ.

Linné.

Constituents.—A *resinous principle* and a volatile alkaloid, *cicutina*.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Not well defined, but worth careful study. It seems to be a motor irritant, and to powerfully influence the medulla oblongata and base of the brain. Tonic and clonic spasms, grinding of the teeth, strabismus, burning pain in the stomach, loss of sensation and consciousness appear in poisoning by this drug. Homœopathic authorities recommend it in cerebro-spinal meningitis. Its use in such cases must necessarily be in minute doses, as above symptoms indicate. Locally, in rheumatic, neuralgic, and gouty pains.

Dose.—Tincture, $\frac{N}{2}$, gtt. j. to iij. to water $\tilde{\text{iv}}$. = gm. 128.00. Teaspoonful doses (gm. 4.00).

CIMICIFUGA RACEMOSA. Black Cohosh.

The fresh rhizome and rootlets.

Ranunculaceæ, Actææ.

Elliott. Bentley and Trimen.

Constituents.—*Resin, volatile oil, tannin*, and a *neutral crystalline principle* of acrid taste; all of which are soluble in alcohol, and but slightly in water.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

A resin, Cimitifugin, as in Sec. 27, Part I.

[Tr. cimitifugæ, U. S. P. = $\frac{N}{5}$.]

Uses.—Indicated in muscular pains of a tensive, aching character, especially when of rheumatic origin; neuralgic or rheumatic conditions of the uterus and ovaries, abnormalities in their functions with reflex nervous disturbances.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent to water, \bar{z} iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

CINCHONA CALISAYA. Yellow Cinchona.

C. Flava of U. S. P.

CINCHONA OFFICINALIS. Pale Cinchona.

Cinchona of U. S. P.

CINCHONA SUCCIRUBRA. Red Cinchona.

C. Rubra of U. S. P.

The barks of above species of Cinchona.

Rubiaceæ, Cinchoneæ.

The following table exhibits the medicinal constituents of the above species, and the characteristics of the most important alkaloids and their sulphates.

	Soluble in Water.	Soluble in Alcohol, 80 per cent.	Soluble in Ether.	Solutions Fluorescent.	Chlorine, Water, and Ammonia.	Rotary Power.	Formulae.
	Parts.	Parts.	Parts.				
Quinia.....	480	30	21	.....	Green	Left	$C_{20}H_{24}N_2O_2.3H_2O$
Quinia Sulphate.....	7-8	60	Insol.	Yes	.....	.....	$2(C_{20}H_{24}N_2O_2).H_2SO_4.7H_2O$
Quinidia.....	1500	45 Abs.	30	.....	Green	Right	$C_{20}H_{24}N_2O_2$
Quinidia Sulphate....	3-0	32 Abs.	.....	Yes	.....	.....	$2(C_{20}H_{24}N_2O_2).H_2SO_4.2H_2O$
Cinchonia.....	3800	140	400	.....	Wht. ppt.	Right	$C_{20}H_{24}N_2O$
Cinchonia Sulphate..	54	5.8	.....	.....	.....	.....	$2(C_{20}H_{24}N_2O).H_2SO_4.2H_2O$
Cinchonidia.....	2580	20	76	.....	Wht. ppt.	Left	$C_{20}H_{24}N_2O$
Cinchonidia Sulphate	100	Sol.	.....	.....	.....	.....	$2(C_{20}H_{24}N_2O).H_2SO_4.4H_2O$
Quinamina } Conquinamina }	Insol.	Sol.	32	.....	No color }	Right Right	$C_{19}H_{24}N_2O$
Kinic Acid.....	Sol.	Partly	Insol.	.....	.....	.....	$C_7H_{12}O_6$
Kinovic Acid.....	Insol.	Slightly	Slightly	.....	.....	.....	$C_{24}H_{38}O_4$
Kino-tannic Acid....	Sol.	Sol.	Sol.	.....	.....	.....	$C_{24}H_{30}O_{35}$
Kinovo-tannic Acid..	Sol.	Sol.	Insol.	.....	.....	.....	.....
Kinovine.....	Slightly	Sol.	Slightly	.....	.....	.....	$C_{30}H_{48}O_8$

The alkaloids exist in above species in variable amounts. The first four are found in all the species; the last two in *C. succirubra* only. The *C. cal.* yields the largest amount of quinia (4 to 5 per cent.).

C. off. contains more cinchonina and cinchonidia, but varies greatly, while C. succirubra yields about 4 per cent. of alkaloids, one-half of which is quinia.

The constituents other than the alkaloids, have no well defined virtues used separately from the principles with which they are associated in the barks. Portions of the first four alkaloids in amorphous state, are found in the mother waters after the preparation of their salts. These are known collectively as *chinoidine*. These amorphous alkaloids are diconchinia ($C_{40}H_{46}N_4O_3$), which is the main constituent of chinoidine from barks with much quinia and quipidia, and dicinchonia ($C_{40}H_{48}N_4O_2$), from barks yielding cinchonina and cinchonidia. All of the above alkaloids will be treated separately in their proper order.

Preparations.—A tincture, $\frac{N}{2}$, with alcohol, 3 parts, glycerine, 1 part, as in Sec. 43, Part I.

A tincture, $\frac{N}{5}$, from C. cal. with alcohol, 13 parts, water, 5 parts, glycerine, 2 parts, proceed as in Sec. 48, Part I. (Equivalent to U. S. P. tincture.)

Uses.—As a stimulant to the cerebro-spinal and ganglionic nerve-centres, it is of great value in the treatment of chronic disease with enfeebled innervation, where periodicity, more or less marked, is a symptom.

See *Quinia sulph.* and other alkaloids.

Dose.—Tincture, $\frac{N}{2}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent.

CINCHONIA, $C_{20}H_{24}N_2O$. M. wt. 308. Cinchonina.

The pure alkaloid as a white powder.

Solubility.—But slightly soluble in water (3800 parts), more soluble in alcohol, 80 per cent. (140 parts), ether (400 parts), and chloroform (60 parts).

CINCHONIÆ SULPHAS, $2(C_{20}H_{24}N_2O) \cdot H_2SO_4 \cdot 2H_2O$. M. wt. 750.
Sulphate of Cinchonina.

The pure salt, in transparent, glassy crystals, which are oblique prisms, and contain 82.14 per cent. of cinchonina, and 4.8 per cent. of water of crystallization.

Solubility.—Soluble in water (54 parts), alcohol, 80 per cent. (5.8 parts), chloroform (60 parts), and in dilute acids. Insoluble in ether.

CINCHONIÆ BISULPHAS, $C_{20}H_{24}N_2O.H_2SO_4.4H_2O$. M. wt. 478.
Acid Sulphate of Cinchonia.

The salt, in octahedral crystals, containing 64.4 per cent. of cinchonia.

Solubility.—Soluble in water (50 parts) and alcohol (90 parts).

CINCHONIÆ HYDROCHLORAS, $C_{20}H_{24}N_2O.HCl.2H_2O$.
 M. wt. 380.5. **Hydrochlorate of Cinchonia.**

The salt, in needles resembling quinia sulphate, and containing 81 per cent. of cinchonia.

Solubility.—Soluble in water (24 parts), alcohol, 80 per cent. (1.3 parts), and slightly in ether.

Uses.—Cinchonia has been used somewhat extensively within a few years, as a substitute for quinia sulphate, having the advantage over it of being almost free from bitterness and much cheaper. It is used in slightly larger doses than quinia sulphate, and the dose of its salts is still larger, depending on the amount of cinchonia in each. It is, perhaps, rather less reliable, but may be considered identical in action with quinia. Its salts are bitter.

CINCHONIDIÆ SULPHAS, $2(C_{20}H_{24}N_2O).H_2SO_4.4H_2O$.
 M. wt. 786. **Sulphate of Cinchonidia.**

The pure salt, in silky, needle-shaped crystals, somewhat resembling quinia sulph., from which it can be distinguished by absence of blue fluorescence when in solution, and by no green color being produced by chlorine water followed by ammonia. Its solutions are precipitated by solutions of neutral tartrates, which distinguish it from cinchonia solutions.

Solubility.—Soluble in water (100 parts) and alcohol, but insoluble in ether.

Uses.—As a substitute for quinia sulph. (which see). It seems nearly equal in efficiency, but produces less disturbance of the nervous system.

CINNAMOMUM. Ceylon Cinnamon.

The bark of *Cinnamomum Zeylonicum*, of light yellowish-brown color, quilled small pieces within large ones, pliable, of thickness of paper and fibrous fracture.

Lauracæ.

Bentley and Trimen.

Constituents.—A volatile oil, *Ol. Cinnamomi* (C_9H_7OH), of bright yellow color when of good quality, becomes red when kept long, and when exposed absorbs oxygen, resinifies partly and cinnamic acid is formed; it is heavier than and insoluble in water, specific gravity 1.035 to 1.055, and very soluble in alcohol. The bark also contains *resin*, *tannin*, and *cinnamic acid*, all soluble in alcohol.

Cassia bark, *Cassia lignea*, or Chinese cinnamon, was for a long time considered a coarser kind of bark from the same plant as Ceylon cinnamon. This is, however, as yet unproven. The cassia is largely substituted for the true cinnamon, but is thicker, coarser, more brittle, less closely quilled, browner and duller in color, and its flavor is less sweet and pure than the Ceylon variety. A decoction of cassia is rendered blue by tincture of iodine, but it does not affect true cinnamon.

Cassia contains an oil, *Ol. Cassiæ*, having similar properties and flavor to those of oil of cinnamon, but inferior to it; its specific gravity is also greater, being 1.060 to 1.065.

Preparations.—From cinnamon bark.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

[*Tinctura cinnamomi*, U. S. P. = $\frac{N}{10}$.]

From the oils.

A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 46, Part I.

A medicated water, $\frac{N}{500}$ (from oil cinnamon only), as in Sec. 15 *a*, Part I.

[*Spiritus cinnamomi*, U. S. P. = $\frac{N}{10}$.]

Uses.—Cinnamon and cassia are often used interchangeably, but the first is preferable for medicinal purposes. The alcoholic solution of the oil is an effective remedy in post partum hemorrhage. The tincture of the bark is used for the same purpose, and in atonic conditions of the intestinal mucous membranes with flatulence and diarrhœa, and in small doses, frequently repeated, in hemorrhages threatening or following miscarriage. *Aq. cinnamom*, $\frac{N}{500}$, is useful in flatulent colic, and as a vehicle.

Dose.—Tincture, $\frac{N}{2}$, gtt. xx. to 3j. = gm. 2.00 to 4.00 to water, 3iv. Mix. Teaspoonful (gm. 4.00) every hour.

Ol. cinnamom or *cassia*, Tincture, $\frac{N}{10}$, gtt. xv. to 3j. = gm. 1.00 to 4.00.

Aq. cinnamom, $\frac{N}{500}$, ad. lib.

CITRUS LIMONUM. Lemon.

The fresh rind of the fruit.

The juice of the fruit.

Aurantiacææ.

De Condolle. Bentley and Trimen.

Constituents.—The rind contains a volatile oil, *Oleum Limonis*, which

has a pale-yellow color, an agreeable odor, and slightly bitter taste. Its specific gravity is .852, and it dissolves in 7 parts of alcohol, specific gravity .839, forming a somewhat turbid solution. It thickens and acquires a turpentine-like odor by age, which change may be retarded by adding 3 to 5 per cent. of alcohol. It is obtained from the fresh rind by expression.

The expressed juice of the ripe fruit contains from 7 to 10 per cent. of *citric acid* ($\text{H}_3\text{C}_6\text{H}_5\text{O}_7, \text{H}_2\text{O}$), *malic acid*, *gum*, *sugar*, *bitter extractive*, and water. Its specific gravity is 1.039 to 1.044. The bitterness of the rind is due to *hesperidin*, which is also found in orange-peel.

Preparations.—The volatile oil.

The freshly expressed juice, *Limonis Succus*.

A syrup, *Syrupus Limonis*, as follows:

Take of Lemon juice freshly prepared and strained, <i>forty parts</i>	40
Lemon-peel, <i>two parts</i>	2
Sugar in coarse powder, <i>sixty parts</i>	60

Heat the juice to boiling-point, add the lemon-peel, cover closely and permit to cool; filter, add the sugar and agitate until dissolved, without heat.

A tincture from *one part* of fresh-grated peel, and *two parts* of alcohol by maceration for eight days, and displacement with alcohol, obtaining *two parts* of tincture.

A tincture of the oil, *Tr. Ol. Limonis*, $\frac{6\text{N}}{100}$, as follows:

Take of Oil of lemon, <i>six parts</i>	6
Tincture of lemon, <i>eight parts</i>	8
Alcohol, <i>eighty-six parts</i>	86

Mix together. (*Spiritus limonis*, U. S. P.)

Uses.—All the preparations of this drug are used as flavors or vehicles for other preparations except the juice. Lemon juice is used in medicine for similar purposes as citric acid, which see.

CLEMATIS VIRGINIANA. Virgin's Bower.

The fresh leaves, when in flower.

Ranunculaceæ, Clematidææ.

Linné.

Constituents.—This plant resembles in properties the *C. erecta* and *C. vitalba*, indigenous to Europe.

All species of *clematis*, when fresh, possess a *volatile, acrid principle*, which may be distilled with water, and is soluble in fixed oils; it is probably an essential oil. *Clematis vitalba* also contains an alkaloid *clematine*, which forms a neutral salt with sulphuric acid. *Tannin*,

mucilage, and earthy salts are also present. The freshly bruised leaves of all species vesicate when applied to tender parts of the skin. The *C. virg.* is less acrid than the foreign, but as the drug should be used in the fresh state, the American species is recommended.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—In its action on the nervous system, it somewhat resembles *pulsatilla*, controlling the nervous erithism accompanying diseases of the reproductive organs. Its use is suggested in epileptiform diseases. The *Clematis cirrhosa* and *sylvestris* are used in Greece for this purpose. The remedy is powerfully diuretic, and is used in albuminuria accompanied with anasarca, and in dropsy following intermittents.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent.

COCCULUS INDICUS. *Cocculus.*

The fruit of *Anamirta cocculus*.

Menispermaceæ.

Bentley and Trimen.

Constituents.—A poisonous principle, intensely bitter, called *picrotoxin* or *picrotoxic acid* ($C_{12}H_{14}O_5$), soluble in alcohol, ether, amylic alcohol, and chloroform, slightly so in water, and dissolving freely in alkaline liquids; a tasteless alkaloid, *menispermia* ($C_{18}H_{24}N_2O$), and *paramenispermia*, associated with amorphous brown *hypopicrotoxic acid*, insoluble in water and ether.

Preparations.—A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I.

Uses.—This remedy directly influences the medulla oblongata and the motor tract of the cord, and is used in nausea and vomiting when of cerebral origin as indicated by accompanying vertigo, giddiness, and intolerance of light, flatulent distention of the stomach and colon with colic, nausea, headache, giddiness, constipation, stools hard and lumpy, menstrual colic and dysmenorrhœa, hysterical hemiplegia and in paraplegia and paralytic stiffness, and loss of power in the lower limbs. Nausea and vertigo with pains in the head are present to a greater or less extent in all cases benefited by *cocculus*.

Dose.—Tincture, $\frac{N}{5}$, gtt. ij. to x. = gm. 0.12 to 0.66 to water $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

COCCUS CACTI. *Cochineal.*

The female insect *Coccus cacti*.

Insecta, Hemiptera.

Linné.

Constituents.—*Carminic acid* ($C_{17}H_{19}O_4$), soluble in alcohol and water, slightly in ether, insoluble in oils; metallic salts yield colored precipitates with it, that of aluminium hydrate being called *lake*. Decoctions of coccus, with a little cream of tartar or alum, deposit carmine when set aside. Carmine of commerce usually consists of carminic acid with about five per cent. of alumina. It should wholly dissolve in ammonia. Cochineal also contains a little *fat* and a *volatile acid*, with some *glutinous compounds*.

Preparations.—A tincture, $\frac{N}{10}$, with diluted alcohol, as in Sec. 47, Part I.

Uses.—Principally as a coloring for medicinal preparations.

COCHLEARIA OFFICINALIS. Scurvy Grass.

The fresh herb.

Cruciferæ, Siliculosæ.

Linné.

Constituents.—A *bitter principle*, *tannin*, and a *volatile oil*, which forms on maceration in cold water. The latter is butyl mustard oil or sulphocyanide of butyl ($CSN.C_4H_7$); it has a specific gravity 0.942, and boils near $160^\circ C.$ ($320^\circ F.$)

Preparations.—A “*Spiritus Cochleariæ*” is used in Europe (P. G.), prepared by macerating *eight parts* of the bruised fresh flowering plant in *six parts* of dilute alcohol, and distilling off *four parts*.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This herb, which is occasionally cultivated in this country for use as a salad, possesses stimulant, diuretic, and antiscorbutic properties, due principally to its essential oil. Its properties are probably identical, therapeutically, with horse-radish, which see (*Amoraciæ Rad.*).

COLCHICI RADIX. Colchicum Root.

The tuber of *Colchicum autumnale*.

Linné.

COLCHICI SEMEN. Colchicum Seed.

The seeds of *Colchicum autumnale*.

Melanthaceæ.

Linné.

Constituents.—*Colchicia* ($C_{17}H_{19}NO_5$), an alkaloid, amorphous, of pale-yellow color, soluble in alcohol, water, and chloroform, slightly in ether. *Fatty resinous matters*; *tannin*, a peculiar acid called *cevadic acid*, *fixed oil* (in seeds), *gum*, *sugar*, and *starch*.

Preparations.—From both seeds and root.

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

[Tinctura colchici (seminis), U. S. P. = $\frac{15N}{100}$.]

[Vinum colchici radiceis, U. S. P. = $\frac{4N}{10}$.]

[Vinum colchici seminis, U. S. P. = $\frac{15N}{100}$.]

Uses.—It is specific in acute gouty and inflammatory conditions.

The seed may be considered as of average strength three times that of the root.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent, repeated so as to induce a slight slowing of the pulse, avoiding pushing it sufficiently to irritate the intestinal surfaces.

COLLINSONIA CANADENSIS. Stone Root.

The fresh root.

Labiatae.

Linné.

Constituents.—When fresh, the entire plant contains an acrid *volatile oil*, which communicates to it a peculiar, somewhat disagreeable, odor when the leaves are rubbed. The taste is pungent. The plant has not been thoroughly analyzed.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—A remedy for hemorrhoids and constipation due to relaxation and vascular engorgement of the pelvic viscera; also, in capillary distention and irritation of secreting surfaces of lungs, stomach, intestines, kidneys, and bladder, as in phthisis, laryngitis, bronchitis, gastritis, renal and vesical irritation, and in catarrhal conditions.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent, two to four times a day.

COLLODIUM. Collodion.

A solution, $\frac{N}{25}$, of pyroxyton or soluble gun-cotton, *four parts*, in a mixture of stronger ether, *seventy parts*, and alcohol, specific gravity .820, *twenty-six parts*.

Keep in cork-stoppered bottles.

COLLODIUM FLEXILE. Flexible Collodion.

A mixture of *ninety-two parts* of collodion with *five parts* Canada turpentine and *three parts* castor-oil.

Keep in cork-stoppered bottles.

Collodium cum cantharide. Flexible collodion *eighty-five parts*, mixed

with *fifteen parts* of extract obtained by chloroform from *sixty parts* of cantharides.

Collodium olei tiglij. Flexible collodion and croton-oil, of each, *one part*, mixed together.

Uses.—Collodium, applied to the skin recently cleansed and thoroughly dried, acts as a protective to abrasions and to some cutaneous eruptions, as herpes, zoster, etc. For such purposes, the flexible collodion is preferable, and a thin coating is required. Collodion contracts considerably in drying, which action is utilized in its application to surfaces where a constricting property is desirable for the purpose of diminishing the blood in a part, thus controlling local inflammation and reducing swelling. With this view it is used in carbuncle, small boils, nævi, and traumatic erysipelas. Thick coats of collodion are used as a means of compression in orchitis, varicocele, spina bifida, and applied so as to encircle the nipple at a small distance, in cases where it is retracted.

Collodium and collodium flexile are excellent vehicles for medicinal substances which are soluble in ether, and where local action is wanted.

Cantharides and croton-oil, as above, are examples. Aconita, atropia, iodine, camphor, tannin, chromic acid, etc., are others that might be used.

COLOCYNTHIS. Colocynth.

The decorticated fruit of *Citrullus colocynthis*.

Cucurbitaceæ.

Schrader. Bentley and Trimen.

Constituents.—A bitter *glucoside*, soluble in alcohol and water, insoluble in ether, and having the composition $C_{56}H_{84}O_{23}$ (?); a tasteless, crystalline principle, *colocynthin*, soluble in alcohol, ether, and hot water; *mucilage*, *pectin*, *fixed oil*, and salts.

The seeds are inert.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

[Ext. colocynth, U. S. P., is made with diluted alcohol, and is used as a constituent of Ext. Colocynth. Co, U. S. P.]

In all the above the “normal” is the fruit weighed with the seeds, which are then removed, and the pulp only used in making tincture or extracts.

Uses.—Used in conditions of the bowels when there is pain of a cutting character, with or without tenesmus, tenderness to contact, disposition to bend double, diarrhœa, and dysentery. The extract, in com-

bination with other purgatives, as in co. ext. colocynth, U. S. P., is much used to overcome constipation in torpid, non-inflammatory conditions. Colocynth is rarely used alone for such purposes.

Dose.—Tincture, $\frac{N}{i}$, grs. v. to x. = gm. 0.33 to 0.66, or equivalent to water ̄iv . = gm. 128.00. Teaspoonful doses (gm. 4.00).

COMPTONIA ASPLENIFOLIA. Sweet Fern.

The fresh leaves and tops.

Myricaceæ.

Aiton.

Constituents.—*Resin, volatile oil, tannin, gallic acid, a principle* analogous to saponin; all soluble in alcohol.

Preparations.—A tincture, $\frac{N}{i}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—In diarrhœas and dysenteries accompanied with much colicky pain.

Dose.—Tincture, $\frac{N}{i}$, gtt. v. to xxx. = gm. 0.33 to 2.00, or equivalent.

CONIUM MACULATUM. Conium Leaves.

The freshly-gathered leaves of the above, the spotted hemlock.

Umbelliferæ, Campylospermæ.

Linné.

Constituents.—The alkaloids, *conia* ($C_8H_{15}N$), *conhydrina* ($C_8H_{17}NO$), and *methylconia* ($C_8H_{14}.CH_3N$), which are probably combined with *malic acid* in the drug; a *volatile oil* of disagreeable odor, but non-poisonous; *acetates* and the usual constituents common to all plants.

Conia (Coninum, P. G.) is a colorless, oily, volatile liquid, of suffocating odor, which vaporizes at $163.5^\circ C.$ ($326.3^\circ F.$), and has a specific gravity 0.88 to 0.89. It is soluble in alcohol, ether, chloroform, fixed and volatile oils, and in water (100 parts). With acids it forms salts freely soluble in alcohol and water.

Conhydrina forms pearly laminæ, with a slight odor of conia, easily fusible, and convertible into conia by phosphoric anhydride, which removes the elements of water.

Methylconia is a frequent constituent of commercial conia, and modifies its action.

Preparations.—A tincture, as follows:

Take of green, freshly-gathered conium leaves, *sufficient*. Reduce to a pulp and express juice, *four parts*, and add to it alcohol to make the mixture weigh *five parts*. This tincture is equivalent to Succus Conii.

—*Br. Pharm.*

A tincture of Conia, $\frac{N}{100}$, made by dissolving conia, *one part*, in alcohol, *ninety-nine parts*. This preparation, the average dose of which is gtt. j., is more definite than any tincture from the plant, and is preferable in most cases.

Bromohydrate of conia may be used hypodermically in solution, *one part*, to water, *nineteen parts*, in doses of 1 to 2 minims, or in solution, in syrup or pill, in doses of gr. 1 to $1\frac{1}{2}$ = gm. 0.06 to 1.10.

[Tinctura conii, U. S. P. = $\frac{15N}{100}$, from the fruit.]

Uses.—In minute doses this remedy stimulates the termination of motor and vaso-motor nerves, increases excretion by skin, kidneys, and bowels, and improves flesh and strength. This stimulation is but transitory; and if the drug is given with too great frequency or in too large doses, motility is impaired through gradual paralysis of motor nerves, beginning at their terminations. The vaso-motor system is also involved, the glandular vessels relax, exudation and eaca plastic deposits result.

In minute doses it is a remedy in low grades of inflammation, involving the glandular system and the capillaries, including those of the mammæ, ovaries, neck, and testes.

In larger doses, sufficient somewhat to impair the conductivity of nerves, it is a remedy in conditions characterized by rigidity of fibre, stitching pains in muscles, and tendency to spasm from excessive intensity of motor innervation, spasmodic, dry cough, etc.

Locally, added to dressings for open ulcers, cancerous or otherwise, it allays pain.

By inhalation from a suitable apparatus, tr. conia, $\frac{N}{100}$, gtt. 2 to 5, in cough of phthisis, irritability and soreness of bronchitis, etc.

Dose.—Tincture conii mae., gtt. v. to 3ss. = gm. 0.33 to 2.00, repeated as required, suspending its use if swallowing or voluntary motion is difficult.

CONVALLARIA MAJALIS. Lily of the Valley.

The fresh plant in flower.

Liliaceæ, Asparaginææ.

Linné.

Constituents.—The glucoside, *convallamarin* ($C_{23}H_{44}O_{12}$), which, when pure, is white, crystalline, of bitter followed by sweetish taste, soluble in alcohol and water, and insoluble in ether; an acrid glucoside, *convallarín* ($C_{34}H_{62}O_{11}$), in crystalline prisms, soluble in alcohol, insoluble in ether, and slightly soluble in water.

The flowers possess an odorous principle, volatile and crystalline, very fragrant when diluted.

The *Convallaria multiflora*, Lin. (*Polygonatum multiflorum*), and *C. polygonatum*, Lin. (*P. officinale*), or Solomon's seal, contain *convallarin*, *asparagin*, *starch*, *pectin*, *mucilage*, etc. *C. caniculata* (*Polygonatum giganteum*), *C. biflora* (*P. biflorum*), and the *Smilacina racemosa* (*C. racemosa*), are all North American plants, known as Solomon's seal.

All these plants have analogous properties, and from this fact are supposed to have similar constituents.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—The glucoside, convallamarin, is a cardiac poison, whose action has not been well studied, but which induces nausea, emesis, and slowing of the heart of animals. Convallarin possesses acidity, and causes copious secretion from the mucous surfaces with which it may come in contact. Large doses produce catharsis similar to that of aloes. The *C. majalis*, possessing all these constituents, is the most active, and is recommended to control dyspnoea pain, oppression, and tumultuous beating of the heart in cardiac diseases. Locally, the flowers have been used in fomentation to bruises, sprains, and ecchymoses. Solomon's seal is used for similar purposes.

Dose.—Of *C. majalis Tinct.* $\frac{N}{1}$, or equivalent, gtt. j. to v. = gm. 0.06 to 0.33, every two hours.

COPAIBA. Copaiva Balsam.

The oleo-resinous exudation obtained from *Copaifera multijuga* and other species of *eopaifera*.

Leguminosæ, Papilionacæ.

Hayne.

Constituents.—*Copaivic acid* ($C_{20}H_{30}O_2$), a resinous acid substance which may be separated in crystalline form, and is soluble in alcohol, carbon-bisulphide ether, fixed and volatile oils; *volatile oil*, Ol. Copaibæ ($C_{10}H_{16}$), clear and pale-yellow or colorless, specific gravity .88 to .91, neutral, soluble in alcohol (40 parts), and slowly thickens and becomes resinous on exposure to the air.

Tests.—*Turpentine* and *other volatile oils*; foreign odor on slowly heating. *Fired oils*; sticky residue after expelling the volatile oil. Copaiva, which forms a clear solution with alcohol, leaves a hard resin after evaporation of volatile oil, does not give an odor of turpentine or other foreign volatile oils on heating, and forms a clear mixture with one-third ammonia, may be considered pure.

Preparations.—Ol. Copaibæ, as described.

Resina Copaibæ, residue after preparing oil.

Uses.—To remove dropsical accumulations by increasing urinary discharge, and for mucœo-purulent discharges from mucous surfaces of air-passages and urinary tract after subsidence of acute symptoms.

Dose.—Balsam, ℥x. to xx. = gm. .66 to 1.20 in capsules, pills (with $\frac{1}{18}$ its weight of magnesia calcined), or emulsion.

Resin, grs. ij. to v. = gm. .13 to .33, thoroughly triturated with sugar of milk.

Oil, ℥x. to xv. = gm. 0.66 to 1.00, especially in bronchial catarrh.

COPTIS TRIFOLIA. Gold Thread.

The recent plant.

Ranunculacææ, Aconitææ.

Bentley and Trimen.

Constituents.—Two alkaloids, *berberina* and *coptina*, the latter of which is similar, if not identical with hydrastia; these are combined in the plant with acids which have not been identified; *resin, fat sugar*, and *albumen*.

Preparations.—A tincture, $\frac{N}{1}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—As a wash in aphthæ, ulcers, and epithelioma; also in psoriasis of mucous membranes, and as a gargle in ulceration of the tonsils. It is similar in property to hydrastis, and may be substituted therefor in most cases.

CORALLIUM RUBRUM. Red Coral.

Polypiphera.

Lamarck.

Constituents.—*Calcium carbonate, magnesium carbonate* in small amount, *ferric oxide*, and a little *organic matter*.

Uses.—Homœopathic authorities recommend this drug in trituration for convulsive coughs, as pertussis, etc.

CORALLORHIZA ODONTORHIZA. Coral Root.

The fresh root.

Orchidacææ.

Nuttall.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—To promote secretion from skin and kidneys in febrile dis-

eases. It is somewhat sedative, and in its action on the skin resembles asclepias.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent.

CORIANDRUM. Coriander.

The fruit (seed) of *Coriandrum sativum*.

Umbelliferæ, Cælospermæ.

Linné.

Constituents.—Volatile oil, *Ol. Coriandri* ($C_{10}H_{16}O$), soluble in alcohol, volatile at 302° F., colorless or pale-yellow, and of specific gravity .86 to .87; *malic acid*; *fatty matters*, *mucilage*, and traces of *tannin*.

Preparations.—A medicated water, $\frac{N}{500}$, from the oil, as in Sec. 15 a, Part I.

Uses.—As an adjunct to purgative medicines to cover their disagreeable taste.

The oil, in doses of gtt. j. to v. = gm. 0.06 to 0.33, as a carminative to relieve flatulence and mitigate griping of other remedies.

CORIARIA MYRTIFOLIA. Currier's Sumach.

The fresh leaves.

Coriariaceæ.

Linné.

Constituents.—*Coriamyrtin* ($C_{30}H_{36}O_{10}$), colorless, crystalline, bitter, soluble in alcohol (50 parts), water (70 parts), and to a less degree in chloroform, ether, and benzol. It also contains *tannin*, and the usual constituents common to leaves.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This drug is analogous to *cocculus indicus* in its poisonous action, and the active principles of both drugs have about equal toxic power.

Coriaria is an occasional dangerous adulterant of *senna*, the leaf of which can be distinguished by having but one vein, while the *coriaria* has three. This drug has been used by homœopathic physicians to a limited extent, and deserves investigation.

Use in same dose as *Cocculus ind.*, and with same precautions.

CORNUS CIRCINATA. Round-leaved Dogwood.

The fresh bark.

Cornaceæ.

L'Heritier.

Constituents.—Not investigated.

CORNUS FLORIDA. Large-flowered Dogwood.

The fresh bark.

Cornaceæ.

Linné.

Constituents.—A bitter principle, *cornin*, which, when pure, is in white needles, soluble in alcohol and water, and slightly in ether; a *resinous, crystalline body, tannin, gallic acid*, and the other usual constituents of barks.

CORNUS SERICEA. Swamp Dogwood.

The fresh bark.

Cornaceæ.

L'Heritier.

Constituents.—Not investigated, but probably similar to *C. Florida*.

Preparations.—From all these species of *Cornus*.

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—All three of the foregoing species of *cornus* have some properties in common. All are useful in obstinate chronic intermittents where nausea, vomiting, and bilious diarrhœa attend the paroxysms; indigestion with stupor, headache, and acid eructations.

C. cireinata is more bitter than the other species, and *C. sericea* the most astringent of the three. The latter forms an excellent astringent remedy in catarrhal conditions of mucous surfaces, as leucorrhœa, gastro-intestinal catarrhs, and in diarrhœas.

Internally, given in tinctures, and locally in infusion.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent, every two hours in absence of fever.

CORYDALIS FORMOSA. Turkey Corn.

The fresh tubers of above (*Dicentra eximia, De Condolle*).

Fumariaceæ.

Constituents.—An alkaloid, *corydalia*, which, when pure, is white, bitter, soluble in alcohol, ether, chloroform, and oils, insoluble in water, but forms soluble amorphous salts with acids. The root also contains an acid *resin, fumaric acid, yellow bitter extractive*, and *starch*, with the usual common constituents of plants.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A powdered extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

Uses.—In ulcerations and erosions of the fauces and mouth; in scrof-

ulous and obstinate cutaneous diseases; in syphilitic diseases, especially in secondary stage.

Dose.—Tincture, $\frac{N}{i}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent.

COTO. Coto Bark.

The bark of an undetermined South American tree, imported from Bolivia.

Constituents.—A light, aromatic *volatile oil*, of pungent taste; *cotoin* ($C_{22}H_{18}O_6$), white, fusible, in crystalline prisms, soluble in alcohol, ether, and chloroform, slightly in cold water, and of persistent, biting taste; *dicotoin* ($C_{44}H_{34}O_{11}$), crystallizable in white scales; a *volatile alkaloid*, probably propylamina, *resin*, *starch*, etc.

Para coto bark is an analogous bark, but of weaker odor and less acrid taste. It contains *paracotoin* ($C_{19}H_{12}O_6$), *leucotin* ($C_{34}H_{32}O_{10}$), *oryleucotin* ($C_{34}H_{32}O_{12}$), *volatile oil* of complex composition, *dibenzoylhydrocoton*, *hydrocotoin* ($C_{15}H_{14}O_6$), and *piperonylic acid* ($C_8H_6O_4$).

Preparations.—A tincture, $\frac{N}{i}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 47, Part I.

Uses.—As far as studied, this remedy is especially valuable in intestinal catarrhs, phthisical and other diarrhœas. On account of the disagreeable effects of the resinous and oily constituents of both coto and paracoto barks upon the stomach, the tinctures are substituted by cotoin and paracotoin, which each practically represent the barks from which they are obtained.

Dose.—Tincture, $\frac{N}{i}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent, well diluted, every two hours.

Cotoin is used in doses of $\frac{3}{4}$ of a grain (0.05 gm.) every two or three hours in powder, or in solution in water with some flavoring ingredient.

Paracotoin possesses similar properties, and may be used in double the dose. (Grs. $1\frac{1}{2}$ = gm. 0.10.)

CREASOTUM. Creasote.

A mixture of volatile compounds obtained by the dry distillation of wood, having the following properties:

An oily liquid, without color, of a peculiar pungent and smoky odor and burning taste; non-crystalline at $-27^{\circ} C.$ ($-17^{\circ} F.$); specific gravity 1.046; it is decomposed by sulphuric and nitric acids. It dissolves resins, fats, and camphor; is not miscible with aq-ammoniæ; coagu-

lates albumen but not collodion, and burns, when ignited, with a sooty flame.

Solubility.—Soluble in cold water (80 parts), hot water (40 parts), and in alcohol, chloroform, benzol, carbon bisulphide, ether, anhydrous glycerine, fixed and volatile oils, acetic acid, and liquor potassæ.

Constituents.—*Guaiacol* ($C_7H_8O_2$), *creasol* ($C_8H_{10}O_2$), and *phloral* ($C_8H_{10}O$) are the most prominent. Cresol (C_7H_8O), xylénol ($C_8H_{10}O$), phenol (C_6H_6O), and other allied compounds, difficult to separate, are stated to be present.

Tests.—*To distinguish from carbolic acid mixtures and coal-tar creasote*; mix with collodion; should remain clear. To *twenty parts* creasote add *one part* solution of ferric chloride; a darker color is produced which turns yellowish green on adding *ten parts* of alcohol. A clear, dilute aqueous solution, if carbolic acid be present, will give with a little ferric chloride a violet-blue color; if absent it will first be blue, then brown, and finally yellow.

Uses.—Useful in stomach pains after eating, vomiting of pregnancy, sea-sickness, cancer and ulcer of stomach, Bright's disease, and as a gargle in sloughs of throat; also, by inhalation, in gangrene of the lungs, and to check excessive secretion from bronchi. Locally, in conditions similar to those in which carbolic acid is used.

Aq. creasoti, $\frac{N}{100}$, made by adding creasote, *one part*, to water, *ninety-nine parts*, and filtering through a wetted filter is the best form for administration, internally, or by inhalation.

Dose.—1 or 2 drops = gm. 0.06 to 0.13, well diluted.

CRETA. Chalk.

Native friable Calcium carbonate. (See *Calcium carbonate*.)

CRETA PRÆPARATA. Prepared Chalk.

The finer and lighter portion of chalk separated from the coarser portions by elutriation, as follows:

Suspend the chalk, finely powdered, in water sufficient to give the mixture the appearance of milk. Allow the heavy and coarse portions to subside, carefully decant the lighter portions still suspended in the water, and set aside for the fine particles to subside. This last sediment may then be dried in any convenient way. Prepared chalk of commerce is usually sold in nodules of a more or less conical shape, formed by pushing the substance, while in the condition of moist sediment, through a funnel tube by means of a wooden rod.

CROCUS SATIVUS. Saffron.

The stigmas of above.

Iridaceæ.

Linné. Bentley and Trimen.

Constituents.—*Volatile oil*; a peculiar coloring matter, *polychroit* or *crocin* ($C_{48}H_{60}O_{18}$), *fat*, *wax*, *gum*, and *albumen*.

Preparations.—A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 47, Part I.
[Tinctura Croci, U. S. P. = $\frac{N}{10}$.]

Uses.—In lumbar pains accompanying menstruation, congestive dysmenorrhœa, blood dark and stringy. To relieve the colic and flatulence of young children, use minute doses.

Dose.—Tincture, $\frac{N}{10}$, gtt. v. to x. = gm. 0.33 to 0.66 to water $\bar{3}$ iv. Teaspoonful doses (gm. 4.00).

CUBEBA. Cubeb.

The unripe fruit of *Cubeba officinalis*.

Piperaceæ.

Miguel. Bentley and Trimen.

Constituents.—*Volatile oil*, Oleum Cubebæ, which, when rectified, is colorless, of warm, camphor-like taste, soluble in alcohol, ether, and oils, specific gravity 0.92, and boils at $250^{\circ}C$. ($482^{\circ}F$.). It consists of cubebene ($C_{30}H_{48}$), and cubeb camphor ($C_{30}H_{46}2H_2O$), and dissolves iodine without violent reaction. Cubebs also contain *resin*, soluble in alcohol and caustic alkalies, slightly soluble in ether and chloroform; *cubebic acid* ($C_{14}H_{16}O_4$), soluble in alcohol, ether, chloroform, benzol, benzine, and carbon bisulphide; *cubebin* ($C_{33}H_{34}$), crystalline, white needles, soluble in alcohol and ether; *fixed oil*, *wax*, *gum*, and *malates*.

Preparations.—An oleo-resin, $\frac{4N}{1}$, with alcohol, as in Sec. 25, Part I.

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

The volatile oil prepared by distillation with water.

[Tinctura cubebæ, U. S. P. = $\frac{N}{10}$.]

Uses.—Given in small doses, gtt. j. to x. = gm. 0.06 to 0.66 of tincture $\frac{N}{1}$, or equivalent, in sub-acute inflammatory conditions of genito-urinary organs, and of gastro-intestinal and pulmonary surfaces. Relaxed conditions of same, characterized by muco-purulent or mucous discharges require larger doses of the tincture, $\frac{N}{1}$, gtt. x. to $\bar{3}$ j. = gm. 0.66 to 4.00, or equivalent.

CUMINUM CYMINUM. Cumin.

The fruit.

Umbelliferæ, *Orthospermæ*.

Linné.

Constituents.—A *volatile oil*, composed of several hydrocarbons, one of the composition $C_{10}H_{16}$, another, cymol or cymene ($C_{10}H_{14}$); and a body containing oxygen, cuminol, or cumin aldehyd ($C_{10}H_{12}O$); also *resin*, *gum extractive*, and *malates*.

Preparations.—A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 40, Part I.

The volatile oil distilled with water, from the fruit.

Uses.—A mild stimulant and carminative, and to antagonize spasm or tendency thereto from reflex irritation.

Dose.—Tincture, $\frac{N}{2}$, gtt. x. to 3ss. = gm. 0.66 to 2.00.

The oil may be used in doses of gtt. j. to x. = gm. 0.06 to 0.66 on sugar or in emulsion.

CUPRI ACETAS, $Cu2C_2H_3O_2.H_2O$. M. wt. 199.5.

Acetate of Copper. Cupric Acetate.

The pure chemical in oblique, rhombic prisms, of a deep blue-green color, efflorescent, and of acid reaction.

Solubility.—Soluble in alcohol with some acetic acid and in water (14 parts). Should dissolve completely in solution of ammonia and ammonium carbonate.

Preparations.—A trituration, $\frac{N}{10}$, as in Sec. 49, Part I.

A tincture made by dissolving cupri-acetas crystallized, *one part*, in water, *ten parts*, and adding alcohol, *eight parts*. Strength, $\frac{N}{10}$.

This tincture is Tinctura Cupri Acetici Rademacheri.

Uses.—In torpid chlorotic cases, and to improve the quality of the blood after exhausting discharges, choleraic or hemorrhagic.

Dose.—Tincture gtt. v. to x. = gm. 0.33 to 0.66 to water 3iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

CUPRI SULPHAS, $CuSO_4.5H_2O$. M. wt. 249.5.

Sulphate of Copper.

The pure chemical in oblique prisms, efflorescent, and of acid reaction.

Solubility.—Soluble in water (3 parts), insoluble in alcohol.

Uses.—In acute and chronic diarrhœas and dysenteries, characterized by stools partly feculent, and containing mucus streaked with blood, accompanied with tenesmus and colic pains.

Dose.—Grs. $\frac{1}{32}$ to $\frac{1}{12}$ = gm. 0.002 to 0.005, every two to four hours, in solution.

Locally, to flabby granulations, ulcers, etc., in solution, grs. ij. to x.

=gm. 0.13 to 0.66, in water $\bar{5}j$. = gm. 32.00. Occasionally as an emetic, in $\frac{1}{2}$ to $\frac{3}{4}$ gr. doses in solution, every fifteen minutes, until effect is produced.

CUPRUM AMMONIATUM, $\text{Cu}(\text{NH}_3)_4\text{SO}_4 \cdot \text{H}_2\text{O}$ (?). M. wt. 245.5.
Ammonio-Sulphate of Copper.

The pure salt in deep blue, crystalline powder, soluble in water ($1\frac{1}{2}$ parts); on exposure to air it loses ammonium hydrate, becomes greenish in appearance, and less soluble in water.

Uses.—A remedy in St. Vitus' dance in doses of gr. $\frac{1}{2}$ = gm. 0.03, in mint water with a little syrup, repeating it three or four times per day, preferably when the stomach contains food. Locally, in solution, in chronic ophthalmia, ulcerations, and in chronic skin diseases, usually in one per cent. solution in water.

CURARE. Indian Arrow Poison.

A poisonous extract variable in power, known as curari, cururu, wourari, wourali, and curare, and which is made by South American Indians as an arrow poison.

Constituents.—*Curaria*, an alkaloid, which, when pure, is colorless, crystalline, very bitter, slightly delequescient in moist air, soluble in alcohol, slightly so in amylic alcohol and chloroform, insoluble in carbon bisulphide, benzol, and ether; *gum, red coloring matter, resin, clay*, etc. Its composition doubtless varies with the source from which it is obtained.

Uses.—A dangerous drug, whose utility is not well defined. Its principal employment has been by hyperdermic injection of a filtered aqueous solution, $\frac{N}{1000}$, in doses of $\frac{1}{10}$ of a grain (gm. 0.006) in grave diseases characterized or attended by severe spasm, as tetanus, hydrophobia, epilepsy, and chorea. In all successful cases, it has been necessary to repeat sufficiently often to maintain complete muscular relaxation. Its use is not advised in the present state of knowledge concerning it. A definite preparation, like the alkaloid curaria, is worth careful study. Its sulphate is said to be about twenty times stronger than the drug curari.

CURCAS PURGANS. Purging Nut.

The seeds.

Euphorbiaceæ.

Adanson.

Constituents.—A *fixed oil*, light-yellow or colorless, and nearly insoluble in alcohol. An *acrid resin* is also present, and is, probably,

the real purging principle of the drug, which is said to reside principally in the embryo.

Uses.—In about the same dose, the oil from this drug possesses purgative properties analogous to croton-oil, and is used in the East Indies for similar purposes. Locally, it irritates the skin, and has been employed in cutaneous eruptions, rheumatic difficulties, and in piles.

CURCUMA LONGA. Turmeric.

The rhizome.

Zingiberaceæ.

Linné.

Constituents.—*Volatile oil, starch, acid potassium oxalate,* and *curcumin* ($C_{10}H_{10}O_3$), the latter being the most important. It is readily soluble in alcohol and ether, slightly in benzol, and freely in alkaline solutions, from which acids throw it down.

Uses.—Turmeric is not used medicinally. Occasionally used as a coloring for ointments. Principally used in form of tincture to prepare "turmeric paper," which is colored brown-red by alkalies, and the yellow color restored by acids. Soluble borates change turmeric paper like alkalies, but the brownish-yellow color is not changed by acids.

CYCLAMEN EUROPÆUM. Cyclamen.

The fresh tuber gathered in autumn.

Primulaceæ.

Linné.

Constituents.—*Cyclamin* or *arthanitin* ($C_{20}H_{24}O_{10}$), a glucoside of acid, bitter taste, soluble in alcohol, water, acetic acid, glycerine, and wood-spirit; insoluble in ether, bisulphide of carbon, chloroform, fixed and volatile oils; *gum, pectin, starch,* and other common principles. Some authorities consider cyclamen identical with saponin.

Preparations.—The homœopathic tincture (essence), made by mixing together equal parts of expressed juice and alcohol.

Uses.—A violent gastro-intestinal irritant, causing emesis, violent catharsis, and even inflammation. Stupefaction, vertigo, obscuration of sight and pressive pains in the forehead are also among the symptoms produced.

It also influences the generative organs of women, probably through reflex irritation of the posterior portion of the cord. It has no useful remedial application, unless as used by homœopathic practitioners in minute doses (3d to 30th potency [?]), in conditions similar to those induced by its poisonous action.

CYNANCHUM VINCETOXICUM. Swallowwort.

The fresh leaves.

Asclepiadaceæ.

Aclepias vincetoxicum of Linné.

Constituents.—The leaves have not been analyzed. The root contains *volatile oil*, *fatty matters*, *pectin*, and a peculiar principle which has not been isolated or identified.

Uses.—This drug is a gastro-intestinal irritant, producing vomiting and active purgation when taken internally in doses of 15 drops (gm. 1.00) of the fresh juice. It is occasionally used in dropsy, and in diseases of the skin, but is a drug which is not well studied.

A tincture (essence) is known in homœopathic pharmacy under the name of *vincetoxicum*.

CYPRIPEDIUM PUBESCENS. Ladies' Slipper.

The fresh rhizome and rootlets.

Orchidaceæ.

Willdenow. Gray.

Constituents.—*Volatile oil*, *resin*, *tannin*, and a *volatile acid principle*; all soluble in alcohol.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A dried extract, $\frac{4N}{I}$, with alcohol, as in Sec. 20, Part I.

A saccharated extract, $\frac{N}{I}$, with alcohol, as in Sec. 21, Part I.

Uses.—In functional disorders of the cerebral and cerebro-spinal centres, characterized by abnormal reflex excitability; in sleeplessness depending upon cerebral-hyperæmia, and associated with restlessness, twitchings, etc.; in the nervous excitement of hysteria, hypochondriasis, delirium tremens, chorea, etc.; in typhomania and restlessness and tremors of patients in low fevers.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

CYTISUS LABURNUM. Laburnum.

The ripe seed.

Leguminosæ, Papilionaceæ.

Linné.

Constituents.—An alkaloid, *citysina*, bitter, crystallizable, white, soluble in alcohol and water, insoluble in ether, chloroform, and carbon-bisulphide, and having the composition $C_{20}H_{27}N_3O$. The unripe seeds contain, also, *laburnin*, bitter, crystallizable, soluble in water, and partially in alcohol and ether. An acid principle, *laburnic acid*, is also present.

Preparations.—A preparation is known in homœopathic pharmacy called “essence,” and made by macerating for eight days, *one part* of a mixture of (equal parts) the fresh leaves and flowers, with *two parts* of alcohol, and filtering.

From the ripe seed.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—In large doses this drug produces poisonous symptoms, characterized by violent abdominal pain, nausea, vomiting, dryness and constriction of the throat, occasional purging, great depression, pulse feeble and rapid, face suffused and red, pupil dilated, and prostration followed by drowsiness. Charcoal is recommended as an antidote, though fatal cases of poisoning are not recorded. Stimulants following the evacuation of the stomach will antidote its depressing effects. The real medicinal value of the drug is not clearly defined, but it is worthy of careful study in gastric neuroses, whether functional or purely reflex.

Dose.—Tincture, $\frac{N}{2}$, gtt. v. to x. = gm. 0.33 to 0.66, to water $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

DATURA STRAMONIUM. Jimson Weed.

The fresh leaves (*Stramonii folia*), collected when the plant is in bloom.

The fresh ripe seeds (*Stramonii semen*).

Solanaceæ.

Linné. Bentley and Trimen.

Constituents.—The leaves contain a small amount of an alkaloid, *daturia*, which strongly resembles atropia in many particulars, but is probably not identical; *mucilage*, *albumen*, and *salts*.

The seeds contain much more *daturia*; a peculiar principle, *stramonina*, not well understood, but which is white, tasteless, insoluble in water, soluble in ether and oils; *resin*, *fixed oil* (25 per cent.), and *mucilage*.

Preparations.—From both leaves and seed.

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

An extract, $\frac{XN}{1}$, from the leaves with alcohol, as in Sec. 19, Part I.

A dried extract, $\frac{4N}{1}$, from the leaves with alcohol, as in Sec. 20, Part I.

From the seed, from which the fixed oil has been removed by means of petroleum benzine.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

An ointment from the leaves, as follows:

Take of Stramonium leaves <i>tinct.</i> , $\frac{N}{1}$, <i>ten parts</i>	.	.	.	.	10
Benzoinated lard, <i>ten parts</i>	.	.	.	.	10

Melt the lard on a water-bath, stir in the tincture, and continue the heat until the alcohol has evaporated; then remove from heat, and stir until cool.

[Tinctura Stramonii (Semen), U. S. P. = $\frac{N}{10}$.]

[Extracta Stramonii, U. S. P., Extracta Stramonii fluidum, U. S. P., are both made from the seed.]

Uses.—Through its influence on the vaso-motor nerves, this powerful drug, when given in minute doses, stimulates, and in large doses paralyzes, the capillaries, especially of the brain, skin, and sexual organs. In minute doses it has proven an efficacious remedy in acute or chronic mania, delirium tremens, and puerperal insanity characterized by loquacious delirium, noisy sometimes furious raving, face red and bloated, and dilated pupils. In larger doses it is useful in respiratory neuroses of a spasmodic character, as asthma coming on periodically; whooping-cough, etc. It is employed in asthma by smoking the dried leaves mixed with equal parts of sage (using about 15 grs. = gm. 1.00 of the mixture at each time, until relieved). Applied topically in ointment, tincture, or fomentation of the bruised or scalded fresh leaves, it is an effectual palliative to the pain of hemorrhoids, fissure, etc., and that caused by the passage of renal or biliary calculi. It is said to be employed in the treatment of the opium habit, and to antidote the poisonous effects of that drug.

Dose.—Folia stramonii, Tinct., $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent to water $\frac{3}{4}$ iv. = gm. 128.00. Teaspoonful doses. The preparations of the seed in one-half the doses of those from the leaves.

DELPHINIUM STAPHISAGRIA. Stavesacre.

The ripe seed.

Ranunculaceæ, *Aconiteæ*.

Linné. Bentley and Trimen.

Constituents.—*Delphia*, or *delphinia* ($C_{24}H_{35}NO_2$), *staphisaina* ($C_{16}H_{23}NO_2$), and *fixed oil*. The first is an amorphous, white alkaloid, soluble in alcohol (10 parts), ether, chloroform, and benzol, and slightly in water. Staphisaina is insoluble in ether and water, but freely so in alcohol. Both alkaloids are very acrid. It is probable that they are not pure alkaloids, but contain those recently announced as found in the fresh seed, *i. e.*, delphinoidin and delphinin.

D. consolida has similar properties.

Preparations.—A tincture, $\frac{N}{7}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Its direct influence is on the organs of reproduction, especially

of the male. Used to quiet irritability of the prostate, testes, and vesiculæ, and arrest mucous and mucopurulent discharges from the urethra.

It also quiets irritation of the neck of the bladder, and is beneficial in disease attended with soreness and difficulty in micturition.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent to water ℥iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

DIGITALIS PURPUREA. Digitalis.

The fresh leaves gathered just before flowering.

Scrophulariaceæ.

Linné. Bentley and Trimen.

Constituents.—The leaves contain *digitalin* ($C_{17}H_{33}O_7$), which, when pure, is in crystalline, colorless needles, soluble in alcohol, ether, and chloroform. *Digitoxin* ($C_{31}H_{53}O_7$), readily soluble in alcohol, slowly in chloroform, slightly in ether, insoluble in water, carbon bisulphide, and benzol; volatile fatty *digitoleic* or *digitaloic* acid; a pearly stearopten, *digitalosmin*, of the odor of digitalis; *digitalacrin*, an acrid principle and a volatile poisonous *alkaloid*.

The seeds contain in addition to *digitalin*, *digitonin* and *digitalein*, the latter being soluble in chloroform, which does not dissolve digitonin.

These are the important constituents of digitalis. The complexity of composition, as above indicated, renders it improbable that any single constituent fully represents its medicinal virtues. Commercial digitalin is itself a mixture of several substances in variable proportions, and is consequently not uniformly reliable in its action. It exists in commerce in two forms, French or insoluble digitalin and German or soluble digitalin. Digitalin of the U. S. P. forms a yellowish-white powder, insoluble in water and ether, but freely soluble in alcohol. It must not be confounded with "digitaline," a so-called "concentrated remedy," which is a powdered alcoholic extract.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

A dried extract, $\frac{4N}{I}$, from the carefully dried leaves, with alcohol, as in Sec. 20, Part I.

[Tinctura digitalis, U. S. P. = $\frac{15N}{100}$. Abstractum digitalis, U. S. P. = $\frac{N}{2}$.]

Uses.—Used in cardiac diseases with frequent, feeble, irregular, and intermittent pulse, distended jugulars, dropsy more or less extensive, periodical or in the worst stages; continuous dyspnœa, worse at night; face dusky, urine scanty, high colored, and depositing copiously on cooling.

Irregularity of the heart's action, with excitement from trivial causes, will be the most prominent symptom in all diseases benefited by digitalis.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent to water \mathfrak{z} iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

DIOSCOREA VILLOSA. Wild Yam.

The recent rhizome.

Dioscoreaceæ.

Linné.

Constituents.—An acrid *resin*, soluble in alcohol, nearly insoluble in water, seems to be the only medicinal constituent of interest, though more careful examination will probably indicate the presence of a neutral bitter principle.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol from the recently dried root, as in Sec. 20, Part I.

Uses.—Used in colic pains of the stomach and bowels from hyperæsthesia of the cœlic or umbilical plexuses of nerves, diarrhœa, and dysentery, with stabbing or spasmodic pain in the abdomen.

Dose.—Tincture, $\frac{N}{1}$, \mathfrak{z} j. to \mathfrak{z} ij. = gm. 4.00 to 8.00, or equivalent to boiling water \mathfrak{z} iv. = gm. 128.00. Teaspoonful doses (gm. 4.00) every ten to twenty minutes.

DIOSPYROS VIRGINIANA. Persimmon.

The unripe fruit.

Ebenaceæ.

Linné.

Constituents.—*Tannin, malic acid, sugar, pectin, and yellow coloring matter*, soluble in ether.

D. embryopteris, or Indian persimmon, and *D. kali*, Japanese persimmon or Chinese date plum, both bear fruits which have in the unripe state similar constituents and properties to the *D. virgin.* The fruit of the *D. kali* is edible when ripe, and is eaten by the Chinese. The inner barks of all these species are astringent and have similar uses.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Used in relaxed and catarrhal conditions of the gastro-intestinal tract, and of the bladder, urethra, and vagina.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xv. = gm. 0.66 to 1.00, or equivalent.

DIRCA PALUSTRIS. Leatherwood.

The bark.

Thymelacææ.

Linné.

Constituents.—Not accurately determined. An *acid resinous principle*, soluble in alcohol, and a *bitter substance* soluble in water, seem to be the most important.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug resembles in action *Daphne mezereum*. It is a gastro-intestinal irritant, inducing salivation, emesis, and purgation.

It is worthy of study in minute doses with special reference to its action in diseased conditions of the mucous tract of stomach and bowels, characterized by irritability, or in larger doses in atonic conditions of the same.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

The berries are emetic and poisonous, and may be studied as with the bark.

DRACONTIUM FÆTIDUM. Skunk Cabbage.

The fresh rhizome and roots gathered when the plant is in flower.

Aracææ.

Linné.

Constituents.—*Volatile oil, resin, an acid principle*, altered or destroyed by heat, *volatile fatty matter, wax, fixed oil, starch*, and *gum*.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used in respiratory neuroses, characterized by oppressed breathing and tendency to spasm, as in spasmodic asthma, whooping-cough, tussis senilis or cough of old people, bronchial catarrh, and bronchitis after acute symptoms have subsided; also in hysteria in similar conditions in which *assafoetida* is usually used.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent.

DRIMYS WINTERI. Winter's Bark.

The dried bark.

Magnoliacææ, Winterææ.

Forst.

Constituents.—*Volatile oil, resin, tannin, coloring matters*, and *salts of potassium, calcium*, and *iron*.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Rarely used. It is a warming, aromatic tonic, which may be usefully employed in atonic states of the digestive organs to improve appetite and the appropriation of food.

Dose.—Tincture, $\frac{x}{i}$, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent, diluted with water or wine.

DROSERA ROTUNDIFOLIA. Sundew.

The fresh plant about to flower.

Droseraceæ.

Linné.

Constituents.—An acrid odorous resin, a peculiar acid, red coloring matter.

Preparations.—A tincture, $\frac{x}{i}$, as in Sec. 41, Part I.

A tincture, $\frac{x}{ii}$, as in Sec. 44, Part I.

Uses.—In irritable, expulsive coughs with dryness of the respiratory surfaces, as that of measles and some cases of whooping-cough.

Dose.—Tincture, $\frac{x}{i}$, gtt. x. to 3ss. = gm. 0.66 to 2.00, or equivalent.

DUBOISIA MYOPOROIDES. Duboisia.

The leaves.

Solanaceæ, Salpiglossidæ.

Robert Brown.

Constituents.—*Duboisina*, or *duboisia*, a volatile alkaloid of yellow color, oily or viscous, lighter than water, and soluble in alcohol, ether, chloroform, water, benzol, and carbon-bisulphide, is the only important constituent; it fully neutralizes acids, and has been proven to be identical with hyoseiamine and daturine; it closely resembles atropia in composition and physiological action; its sulphate is the form in which it is most used.

Duboisia Hopwoodii or *Pituri*, a substance chewed by the natives of some parts of central Australia, contains an alkaloid *piturina*, which is doubtless identical with *duboisina*, though this is as yet unsettled.

Uses.—These have been confined thus far to hypodermic injection of solution of the sulphate of *duboisia*, in doses representing grs. $\frac{1}{84}$ to $\frac{1}{20}$ = gm. 0.0010 to 0.0033, to check excessive sweating of phthisis, etc., and to the use of a solution of the sulphate (grs. 2 to 4 to 3j.) as a mydriatic (gtt. ij. to v.) in diseases of the eye, where it is necessary to paralyze the accommodation and dilate the pupil, as in injuries and diseases of the cornea, spasm of accommodation, iritis, etc. It is said to be more prompt in action than atropia, but that the effects pass off more rapidly. Some dizziness is nearly always produced by its use, but dryness of the throat is rare.

Internally, *duboisia* has been but little used, but as it is found to resemble *belladonna*, it may come into use in similar conditions.

DULCAMARA. Bittersweet.

The young branches of *Solanum dulcamara*, recently gathered.

Solanaceæ.

Linné.

Constituents.—A small quantity of the alkaloid *solania* ($C_{43}H_{70}NO_{16}$), bitter, slightly soluble in water, alcohol, and ether, and which is considered by some authorities a conjugated compound of sugar with solanidine ($C_{25}H_{39}NO$); a glucoside, *dulcamarin* ($C_{22}H_{34}O_{10}$), which, when isolated, has a bitter followed by a sweet taste, soluble in alcohol and water, insoluble in ether, chloroform, benzine, and carbon-bisulphide; *resin*; *wax* and *gum*.

Preparations.—A tincture, $\frac{N}{T}$, as in Sec. 41, Part. I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—A remedy in suspension or impairment of the functional activity of the skin, due to sudden changes of temperature, characterized by hyperæmia of mucous membranes with excessive discharge of mucus, as in acute catarrhs, with cough, diarrhœa and dysentery with much mucus in discharges; also in rheumatic affections in cold, damp weather, and in many skin diseases, as tetters, rashes, furuncles, urticaria, psoriasis, acne, and eczema.

Dose.—Tincture, $\frac{N}{T}$, gtt. x. to 3j. = gm. 0.66 to 4.00, or equivalent.

ELATERIUM. Elaterium.

A substance deposited from the juice of the fruit of *Ecbalium officinarum* (*Momordica elaterium*—Linné), or squirting cucumber.

Cucurbitaceæ.

Bentley and Trimen.

Constituents.—*Elaterin* ($C_{20}H_{28}O_5$), colorless, crystalline, bitter and acrid in taste, soluble in alcohol, chloroform, and carbon-bisulphide; *prophetin*, a glucoside forming a powder of yellowish color, soluble in ether and alcohol, slightly in water; *elateric acid*, soluble in alcohol, ether, and water. *Hydroelaterin* and *elaterid* are also said to be present.

Preparations.—A tincture, $\frac{N}{100}$, made by macerating elaterium, *one part*, with alcohol, q. s., when filtered to make *one hundred parts*.

A trituration, $\frac{N}{10}$, as in Sec. 49, Part I.

Uses.—In doses of gr. $\frac{1}{16}$ to $\frac{1}{8}$ = gm. 0.0080 = 0.0040, repeated with caution at intervals of four to six hours, used to procure free

watery discharges from the bowels in ascites, anasarca, and uremia; also, in inflammation of the neck of the bladder, with deep soreness and passage of pus or muco-pus.

Dose.—Tincture, $\frac{N}{100}$, ʒss. to ʒj. = gm. 2.00 to 4.00, until bowels move, and afterwards in doses of gtt. j. to v. = gm. 0.06 to 0.33, or equivalent amount of trituration, $\frac{N}{10}$.

EPIGEA REPENS. Trailing Arbutus.

The fresh leaves.

Ericaceæ, Ericinææ.

Linné.

Constituents.—*Arbutin*, *urson*, and *ericolin*, principles found also in the uva ursi, are said to be present, together with *tannin*, *formic acid*, and *gallic acid* (?).

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Used in diseased conditions of the urinary tract depending or accompanying the presence of renal calculi composed of uric acid; also in dysuria, strangury, and tenesmus with muco-purulent sediment in the urine, and in vesical catarrh.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent.

EPILOBIUM ANGUSTIFOLIUM. Willow Herb.

The fresh herb.

Onagraceæ.

Linné. Gray.

Constituents.—*Tannic* and *gallic acids*, with *mucilage*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Used in chronic diarrhoea accompanied by tenesmus and mucous discharges.

E. palustre has similar properties.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xx. = gm. 0.66 to 1.33, or equivalent.

EPIPHEGUS VIRGINIANA. Beechdrop.

The entire plant in flower.

Orobanchaceæ.

Gray. Bart.

Constituents.—These have not been investigated. The taste is bitter, astringent, and nauseating. *Tannic* and *gallic acids* are present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—These have been principally used as an astringent local application (in powder and decoction), to fungous growths and unhealthy ulcers. Its sensible properties suggest its employment internally, not only in relaxed and catarrhal conditions of the intestinal tract, but in minute doses as a glandular stimulant.

Dose.—Tincture, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent.

EQUISETUM HYEMALE. Scouring Rush.

The fresh plant.

Equisetaceæ.

Linné.

Constituents.—*Resin, wax, sugar*, and the common vegetable principles. Eight per cent. of the dried plant is silica.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—In decoction, in doses of 1 or 2 teaspoonfuls (gm. 4 to 8) several times per day, or in tincture, $\frac{N}{2}$, gtt. v. to x. = gm. 0.33 to 0.66, in hot water, frequently repeated, this remedy is useful to increase the urinary secretion and allay irritability of the surfaces of the urinary tract in hæmaturia, calculus affections, dysuria with severe pain after urinating, suppression of the urine, dropsy, gonorrhœa, and gleet.

ERECTHITES HIERACIFOLIA. Fireweed.

The recent leaves and tops.

Compositæ, Senecionideæ.

Gray.

Constituents.—These are not well defined. An oil, known in commerce as “Oil of Fireweed,” is obtained from this plant, but is often substituted by oil of *erigeron canadense*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A tincture, $\frac{N}{10}$, of the oil with alcohol, as in Sec. 46, Part I.

Uses.—Used as a stimulant to mucous membranes of gastro-intestinal and urinary tracts, and for its influence in controlling hemorrhages by contracting the arterioles; also in passive hemorrhages of rather dark-colored blood, with fulness and inelasticity of tissue and laxity of the coats of the vessels, and in hemorrhages of typhoid fever and Bright's disease.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to 5j. = gm. 0.66 to 4.00, or equivalent.

Tincture Ol. *Erecthites*, $\frac{N}{10}$, may be used in same doses.

In hemorrhage from lungs, bowels, uterus, and kidneys, blood-bright red, minute doses (homœopathic dilutions) will often prove efficacious. In dysentery with discharges of blood, gonorrhœa and gleet with painful bloody discharges, minute doses.

ERGOTA. Ergot.

The compact mycelium (sclerotium) or spawn of *Claviceps purpurea*, replacing the grain of common rye, *Secale cereale*—*Linné*.

Fungi.

Tulasne.

Constituents.—According to the most recent investigations these may be divided into crystalline and non-crystalline, the latter of which classes include those of greatest medicinal value, and are as follows: *sclerotic acid*, tasteless, odorless, light-brown in color, soluble in water, but not in strong alcohol; *scleromucin*, odorless, tasteless, gummy, insoluble in alcohol, and but slightly in water; *sclererythrin*, soluble in alcohol, ether, and chloroform; *scleroiodin*, insoluble in water, alcohol, and ether. The first two of these are most active and are present in large amount.

The crystallizable principles are *sclerocrystallin* and *scleroxanthin*, which seem to be inert; two alkaloids, *ecbolina* and *ergotina*, of brownish color, bitter taste, soluble in water, and by some considered identical, and which, when pure, are said to be inert; a third alkaloid, *ergotinina*, which has some activity and two acids, *ergotic* and *fuscosclerotic*.

Trimethylamin, said to be a decomposition product, is obtained from ergot by distillation.

Ergot contains 28 to 35 per cent. of *fixed oil*, which is without active properties, *acrid resin*, *cholesterin*, *lactic*, *formic*, and *acetic* acids, and *phosphatic* salts. This complexity of composition of ergot necessitates peculiar processes for preparations which will represent its medicinal principles.

Preparations.—A tincture, $\frac{N}{I}$, as follows:

Exhaust ergot, ground to a coarse powder, with purified benzine by percolation until a small portion of the liquid does not leave a stain on paper on evaporation therefrom.

Take of Ergot with the fixed oil thus removed, <i>seven parts</i> . . .	7
Exhaust by percolation with cold water, and evaporate the percolate to <i>four parts</i>	4
Add alcohol, <i>three parts</i>	3

Allow the mixture to stand two hours, and filter.

An extract, $\frac{5N}{I}$, as follows:

Take of Tincture, $\frac{N}{I}$, five parts.	5
Evaporate at a temperature not exceeding 52° C. (126° F.), by means of a water-bath until reduced to one part	1

Uses.—Used for its direct influence in causing contraction of the smooth fibres of blood-vessels and of organs through which they ramify; also, to arrest hemorrhages by effacing the calibre of vessels, or compressing them through the contractile influence alluded to; in hemorrhages when the tissues are full and inelastic, the patient inclined to sleep, intellect dull.

Dose.—Tincture, $\frac{N}{I}$, gtt. i. to 3ss. = gm. 0.06 to 2.00.

Extractum ergotæ, $\frac{6N}{I}$, may be used hypodermically where prompt effects are required; for this purpose one (1) part should be dissolved in water and filtered, adding water through the filter to make up the weight to five (5) parts. This solution is of the same strength as the tincture, $\frac{N}{I}$, which may be used when the extract is not at hand.

Extract ergotæ, $\frac{6N}{I}$, prepared as above, or an equivalent process, is known in commerce as Bonjean's ergotin.

Extract ergotæ, $\frac{6N}{I}$, by hypodermic injection, grs. $\frac{1}{6}$ to v. = gm. 0.01 to 0.33, per day in solution, as above prepared.

ERIGERON CANADENSE. Canada Fleabane.

The leaves and tops recently gathered.

Compositæ, Asteroideæ.

Linné. Bentley and Trimen.

Constituents.—*Volatile oil*, Ol. Erigerontis Can., a pale-yellow, limpid liquid, persistent peculiar odor, and slightly pungent taste, specific gravity .845. It is freely soluble in alcohol when fresh, but age thickens it, and it becomes less soluble. *Tannin* and *gallic acid* are also said to be present.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A tincture, $\frac{N}{10}$, of the oil with alcohol, as in Sec. 46, Part I.

Uses.—Used to restrain passive hemorrhages from any organ or part; also, as a capillary astringent in catarrhal and muco-sanguineous fluxes from the genito-urinary organs or the mucous membranes of the colon and rectum.

Dose.—The oil or its tincture (tinct. ol. erigerontis), $\frac{N}{10}$, in doses of gtt. v. to x. = gm. 0.33 to 0.66, on sugar, or tincture, $\frac{N}{I}$, gtt. x. to 3i. = gm. 0.66 to 4.00, or equivalent.

In active hemorrhages with a strong, not very frequent pulse, smaller doses than above are to be preferred.

ERIGERON HETEROPHYLLUM. Fleabane.

The leaves and tops recently gathered.

Compositæ, Asteroideæ. Bentley and Trimen. Gray.

Constituents.—A *viscid oil* of penetrating odor, and pungent, somewhat bitter taste, is the only constituent that has been isolated.

E. Philadelphicum and E. strigosum are frequently collected with the E. heterophyllum. They possess similar if not identical properties.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{3}$, as in Sec. 45, Part I.

Uses.—Used as a diuretic in dropsical conditions, and in irritation of the renal and vesical surfaces, especially when associated with the presence of uric acid and urates in the urine.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to ʒj. = gm. 0.06 to 4.00, or equivalent.

ERIODICTYON CALIFORNICUM. Yerba Santa.

The leaves. (E. glutinosum.)

Hydrophyllaceæ. Bentham.

Constituents.—An acrid *bitter resin*, soluble in ether and alcohol; *resin*, soluble in ether only, and apparently without activity; a *glucoside* of the tannic acid series; *green coloring*; *brown extractive*; *caoutchouc*; *wax*; *tannic acid* in small amount, and *sugar*.

Alcohol extracts all its medicinal constituents.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A saccharated extract, $\frac{N}{1}$, with alcohol, as in Sec. 21, Part I.

Uses.—Used in bronchial affections and coughs with abundant and easy expectoration, and in absence of inflammatory movement.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xx. = gm. 0.33 to 1.33 or equivalent.

ERYNGIUM YUCCÆFOLIUM. Water Eryngo.

The recent rhizome.

Umbelliferæ Orthospermæ. Michaux.

Constituents.—*Resinous matters* and *volatile aromatic oil* are probably its active constituents, though no analysis has been made.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used in irritation and catarrhal inflammation of the urinary tract, characterized by painful micturation with uneasiness in the bladder and loins; also in catarrhal inflammations of mucous surfaces of the air-passages, and of the intestinal canal.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xx. = gm. 0.66 to 1.33, or equivalent.

ERYTHROPHLÆUM. Sassy Bark.

The bark of *E. guiniense*.

Leguminosæ, Cæsalpinæ.

Don. A. J. P., vol. xxiii.

Constituents.—*Erythrophleina*, an alkaloid soluble in water, alcohol, amyl alcohol, and acetic ether, less soluble in ethylic ether, benzene, and chloroform. It is a direct poison to the heart, causing paralysis. The bark also contains *tannin* and a red *substance* derived from it.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—In small doses it diminishes the calibre of blood-vessels, increasing arterial pressure and promoting diuresis, for which reason it has been recommended in cardiac dropsy depending on mitral obstruction. It is also recommended to overcome the capillary relaxation present in passive hemorrhages, and in the treatment of diarrhœa, dysentery, and periodic fevers.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

ERYTHROXYLON COCA. Coca.

The leaves.

Erythroxylacææ.

Lamarck. Bentley and Trimen.

Constituents.—*Cocaina* ($C_{17}H_{21}NO_4$), an alkaloid soluble in alcohol, ether, and partially in water (704 parts); a volatile alkaloid, *hygrina*, pale-yellow and oily, and a form of tannin called *cocatannic acid*. The other constituents are unimportant.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, 1 part, water, 2 parts, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, 1 part, water, 2 parts, as in Sec. 43, Part I.

Uses.—As an exhilarant similar to tea and coffee, occasionally useful in states of depression with feeling of weariness. In small doses it is employed for the dyspnœa due to functional heart disorders.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to 5j. = gm. 0.06 to 4.00 or equivalent.

EUCALYPTUS GLOBULUS. Eucalyptus.

The recent leaves.

Myrtaceæ.

Labillardière. Bentley and Trimen.

Constituents.—A fragrant *volatile oil* of yellow color, specific gravity 0.917 at 59° F., and which is composed of two terpenes ($C_{10}H_{16}$) of different boiling points, cymol ($C_{10}H_{14}$), and eucalyptol ($C_{10}H_{16}O$). Oil of eucalyptus readily oxidizes, for which reason it usually contains more or less resinous matter. The leaves contain also *tannin*, an amorphous *acid resin*, an *acid yellow resin* of bitter taste, an *acid crystalline body*, *eucalyptic acid*, a *bitter crystalline* substance, soluble in alcohol and ether, slightly so in water, and an *acid crystalline resin*, reacting brown-red with ferric chloride. The identity of all these principles is not clearly established.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used in chronic catarrhal conditions of the mucous surfaces of the air passages, genito-urinary organs, and gastro-intestinal tract. The volatile oil is eliminated both by bronchia and kidneys, rendering both breath and urine odorous, and acting as a salutary stimulant to the secreting surfaces. Also used as a stimulant to the circulation in cerebral anæmia, hysteria, chorea, and allied nervous affections with coldness of the surface and cold perspiration, chronic malarial poisoning after the interruption of the paroxysms by quinia, and in convalescence from intermittents.

The volatile oil possesses, in common with other terpenes, the property of converting water, in the presence of air and sunlight, into hydrogen peroxide, or to convert oxygen into ozone, which is the explanation usually given of its deodorizing and antiseptic properties.

The oil or tincture may be used locally as a lotion, or by inhalation or gargle, to remove fetor and to destroy the lower organisms accompanying diseased conditions.

Dose.—Tincture, $\frac{N}{I}$, gtt. ij. to x. = gm. 0.12 to 0.66 or equivalent, oil, gtt. j. to v. = gm. 0.06 to 0.33.

In malarial diseases larger doses are required.

Water impregnated with the oil by the method given in Sec. 17, Part I., forms an excellent deodorizing application to foul ulcers and wounds, and to remove offensive odors from the hands.

EUONYMUS ATROPURPUREUS. Wahoo.

The recent bark of the root.

Celastraceæ.

Jacquin. Gray.

Constituents.—A neutral, bitter principle, *euonymin*, soluble in alcohol and water; *asparagin*; *euonic acid*; *several resins*; *fixed oil*; *citric, malic, and tartaric acids*, with the usual common non-medicinal principles of plants.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{I}$, with alcohol, as in Sec. 20, Part I.

An extract with alcohol, as in Sec. 19, Part I.

Uses.—Used in hepatic and gastro-intestinal disorders, characterized by depression of function, headache, malaise, and yellow tongue.

Dose.—Dried extract, $\frac{4N}{I}$, 1 or 2 grs. = gm. 0.06 to 0.13, in pill form on retiring, or better

Tincture, $\frac{N}{I}$, gtt. v. to xx. = gm. 0.33 to 1.33, three or four times per day.

In chronic malarial poisoning, when attended by diarrhœa, small doses repeated at intervals.

EUPATORIUM AROMATICUM. White Snake Root.

The recent root gathered in autumn.

Compositæ, Eupatoriæ.

Gray.

Constituents.—These have not been fully examined.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used in nervous crithism, restlessness, morbid watchfulness, tremors, jactitations, hysteria, and chorea; also in aphthous diseases and in stomatitis with above nervous symptoms.

E. ageratoides possesses similar properties, and may be prepared and used as above. It possesses diaphoretic powers similar in character to *Asclepias tub.*

Dose.—Tincture, $\frac{N}{I}$, gtt. x. to 3j. = gm. 0.66 to 4.00, to water 3iv. = gm. 128.00, or equivalent. Teaspoonful doses (gm. 4.00).

EUPATORIUM PERFOLIATUM. Boneset.

The fresh leaves and tops gathered when flowering has commenced.

Compositæ, Eupatoriæ.

Linné. Bentley and Trimen.

Constituents.—A *bitter principle*, which has not been examined; a small amount of *volatile oil*; *tannin*, and the usual non-medicinal principles.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A dried extract, $\frac{N}{1}$, with alcohol, as in Sec. 20, Part I.

Uses.—Used in intermittent and remittent fevers, characterized by impairment of function of the gastro-hepatic system, deep-seated soreness of the muscles of the back and limbs, aching apparently in the bones, severe chill followed by vomiting of bile, or severe nausea with fulness of pulse and skin, and sweating or moisture even during fever; also in bronchial irritation with severe cough, and attended with the peculiar soreness above alluded to.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent to water $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

EUPATORIUM PURPUREUM. Queen of the Meadow.

The recent root gathered in autumn.

Compositæ, Eupatoriææ.

Linné. Gray.

Constituents.—These have not been thoroughly examined. The plant yields its virtues to alcohol.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used in functional derangement of the bladder and kidneys, characterized by suppression or passage of urine a few drops at a time, with urging, smarting, and burning in the urethra, distress in the bladder, and pain in the region of the kidneys, and in renal dropsy, ovarian and uterine atony, amenorrhœa, and dysmenorrhœa.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to $\bar{3}$ j. = gm. 0.66 to 4.00, or equivalent to water $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

EUPHORBIA COROLLATA. Large Flowering Spurge.

The recent root.

Euphorbiaceæ.

Linné. Meehan, Native Flowers.

Constituents.—These have not been examined thoroughly. An emetic principle is present, which is similar to that of *E. ipecacuanha*.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Used in gastric irritation with profuse watery vomiting, tongue elongated and pointed, enteric irritation, or inflammation characterized by tormina, bloody stool with tenesmus, serous diarrhœa, dysentery preceded by diarrhœa and vomiting, as in cholera infantum and colliquative diarrhœas of typhoid and consumption.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xv. = gm. 0.66 to 1.00 to water $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

EUPHORBIA HYPERICIFOLIA. Large Spotted Spurge.

The fresh herb.

Euphorbiaceæ.

Linné.

Constituents.—These are said to be *tannin*, *resin*, *caoutchouc*, and *gallic acid*, but no recent examination has been made.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used in diarrhœa with greenish irritating discharges and intestinal irritation of infants.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent to water $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

The *E. maculata* is said to possess similar virtues, and may be prepared and used in the same manner.

EUPHORBIA IPECACUANHA. American Ipecac.

The recent root.

Euphorbiaceæ.

Linné.

Constituents.—*Resin*, *caoutchouc*, *gum*, and *starch*.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part. I.

Uses.—So far as investigated, its properties resemble those of *E. corollata*, for which it may be substituted.

EUPHORBIIUM. Euphorbium.

The gum-resin from *E. resinifera*.

Euphorbiaceæ.

Bentley and Trimen.

Constituents.—A crystallizable resin, *euphorbon* ($C_{26}H_{44}O_2$), soluble in ether, benzol, chloroform, acetone, glacial acetic acid, hot alcohol, and in sixty parts cold alcohol; an *acrid resin* ($C_{20}H_{32}O_4$), soluble in alcohol; *malates of calcium and sodium*, *gum*, and mineral compounds.

Uses.—An irritant to the skin and mucous membranes, producing from the latter excessive secretion of watery and even bloody mucus. Its intensely irritating character makes it an unsafe agent for internal use, though it has been employed occasionally as a drastic purgative in dropsy. It is sometimes used in plasters intended to prolong suppuration, and as a local stimulant in paralysis. A tincture, $\frac{N}{10}$,

with alcohol, as in Sec. 47, Part I., will be equivalent to tr. euphorbii of the Pharm. Germ.

EUPHRASIA OFFICINALIS. Eyebright.

The fresh plant in blossom.

Scrophulariaceæ.

Linné.

Constituents.—An *acid and bitter* principle, *volatile oil* in small amount, a tannin-like body; *euphrastic acid* ($C_{32}H_{20}O_{17}$), and the common principles of herbs.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{x}$, as in Sec. 44, Part I.

Uses.—Used in acute catarrhal inflammation of the upper portion of the respiratory mucous membrane, characterized by profuse secretion of acrid mucus from the eyes and nose, with heat and pain in the frontal sinuses.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent, in a wineglassful of water, every two or three hours.

Locally, gtt. v. to xv. = gm. 0.33 to 1.00 in water $\mathfrak{z}iv$. = gm. 128.00 as a collyrium.

FEL BOVIS PURIFICATUM. Purified Ox-gall.

The purified gall of the ox (*Bos taurus*) in yellowish-white scales or powder, soluble in alcohol and water, and seven parts of which represent one hundred parts of fresh ox-gall.

Preparations.—

Take of fresh ox-gall, <i>one part</i>	. . . . .	1
Alcohol, <i>one part</i>	. . . . .	1
Recently purified and still moist animal charcoal, a sufficient quantity	. . . . .	q. s.

Mix the alcohol and ox-gall, shake thoroughly together and filter; evaporate or distill off the alcohol from the filtrate, and to the residue add charcoal equal to one-tenth of the weight of the ox-gall employed. Agitate together, until when filtered the liquid is faint yellow in color; evaporate to dryness by means of a sand-bath at a temperature not exceeding 100° C. (212° F.) and reduce to powder, which should be kept in glass-stoppered bottles on account of its liability to absorb moisture.

Uses.—A remedy for constipation and certain forms of dyspepsia dependent on a failure of the liver to secrete, or on obstruction of the gall ducts, preventing the escape of the necessary bile for the perfect performance of duodenal digestion.

Dose.—In pill form, coated with gelatine or inclosed in gelatine capsules, in doses of grs. v. to x. = gm. 0.33 to 0.66, after meals.

FERRI ACETAS, $\text{Fe}_26\text{C}_2\text{H}_3\text{O}_2$. M. wt. 466. **Ferric Acetate.**

Not in common use in the dry form, but may be obtained by evaporating solution of ferric acetate at a temperature of 15° to 17° C. (59° to 62° F.) and scaling from glass. A higher temperature decomposes the salt. The most eligible preparations of this salt are described below.

Solubility.—Freely soluble in water and alcohol. The solutions are readily decomposed when very dilute, if exposed to light and warmth.

Tests.—To a solution of the salt add ammonium hydrate in excess, and filter; a portion of the filtrate should not leave any residue on evaporation. *Zinc*; white precipitate with sulphuretted hydrogen to the above filtrate. *Lead*; black precipitate from preceding test. *Copper*; blue color of filtrate after precipitating with excess of ammonium hydrate. *Sulphates*; white precipitate from addition of barium chloride to same filtrate acidulated with nitric acid. *Chlorides*; white precipitate from the acidulated filtrate on addition of solution of silver nitrate.

Preparations.—Liquor Ferri Acetici, $\frac{33.28\text{N}}{100}$. Solution of Ferric Acetate.

A solution of ferric acetate made by digesting in a cool place, and with frequent agitation, 6 *parts* of acetic acid (specific gravity 1.040), with 5 *parts* of freshly precipitated, well washed but still moist ferric hydrate, obtained from 10 *parts* solution of tersulphate of iron (specific gravity 1.318), and, after several days, filtering and adjusting the weight to 10 *parts*. The solution contains 8 per cent. of iron = 11.43 per cent. ferric oxide, or 33.28 per cent. ferric acetate, and has a specific gravity 1.1143.

Tinctura Ferri Acetici Ætherea.

A mixture of solution of ferric acetate, 9 *parts*; alcohol, 2 *parts*; acetic ether, 1 *part*.

Uses.—This is one of the most pleasant and effective of ferric salts, and may be administered in water or syrup in doses of gtt. v. to 5ss. = gm. 0.33 to 2.00 of the tincture, or equivalent amount of the solution. The latter is stable, and may be used to make the tincture as wanted.

FERRI BROMIDUM, FeBr_2 . M. wt. 216.

Bromide of Iron. Ferrous Bromide.

The pure salt in a mass of a grayish-black color, which becomes of a brown color on exposure to action of the air, owing to oxidation.

Heated to redness, a portion of the salt is converted into ferric oxide and ferric bromide sublimes.

Solubility.—Soluble in water.

Preparations.—Syrupus Ferri Bromidi, $\frac{9.45\text{N}}{100}$. 100 parts containing 9.45 parts ferrous bromide.

This form of preparation is more permanent than the dry salt or its solution, the sugar partially preventing oxidation as in the case of syrupus ferri iodidi. Like that preparation, however, it gradually decomposes by age.

Uses.—Ferrous bromide is extensively used in the preparation of potassium bromide. As a medicine, its utility is questionable. It has been recommended in scrofulous, glandular, and cutaneous affections, given internally in form of syrup in doses of gtt. x. to 3j. = gm. 0.66 to 4.00, and also applied topically in solution. The preparation seems to partake largely of the irritant and poisonous character of bromine, and should be used with caution.

FERRI CHLORIDUM, $\text{Fe}_2\text{Cl}_6 \cdot 12\text{H}_2\text{O}$. M. wt. 541.

Hydrous Ferric Chloride.

The pure salt, in orange-colored, crystalline fragments, acid reaction, and of strong styptic taste.

Solubility.—Soluble in alcohol, water, ether, glycerine, and to a partial extent in chloroform.

Tests.—Complete solution in water and alcohol; an insoluble residue indicates partial decomposition. *Ferrous chloride*; blue precipitate with potassium ferricyanide from very dilute solution. *Fixed impurities*; completely precipitate a solution of the salt with aqua ammonia in excess, heat to boiling, and filter; evaporate a portion of the filtrate to dryness, and heat to redness; no residue should remain. *Sulphates*; add barium chloride to a portion of the filtrate obtained as in the previous test, and previously acidulated with a few drops of hydrochloric acid: a white precipitate indicates sulphates. *Nitric acid*; to a solution of the ferric chloride add a crystal of ferrous sulphate and a few drops of pure and strong sulphuric acid; a black coloration near the crystal indicates nitric acid. *Copper*; blue color of filtrate after adding excess of ammonia.

Preparations.—Liquor Ferri Chloridi, $\frac{61.67\text{N}}{100}$. Solution of Ferric Chloride.

A reddish-brown solution of ferric chloride, specific gravity 1.355, which should show no impurities by above tests. It has an acid reac-

tion and strong styptic taste. 100 parts treated with aq. ammonia in excess, should yield a precipitate, which, washed, dried, and ignited, will produce of ferric oxide 18.30 parts, equivalent to 61.87 parts of hydrous ferric chloride ($\text{Fe}_2\text{Cl}_6, 12\text{H}_2\text{O}$), or 37.16 parts of anhydrous ferric chloride (Fe_2Cl_6). [U. S. P.]

Tinctura Ferri Chloridi, $\frac{19.10\text{N}}{100}$. Tincture of Ferric Chloride.

A mixture of liq. ferri chloridi, *seven parts*, and alcohol, *thirteen parts*. 100 parts yield 5.65 parts ferric oxide (Fe_2O_3), equivalent to 11.47 parts of anhydrous ferric chloride (Fe_2Cl_6), or 19.10 parts of hydrous ferric chloride ($\text{Fe}_2\text{Cl}_6, 12\text{H}_2\text{O}$).

Tests.—Same as for Ferri chloridum. [U. S. P.]

Uses.—Used in solution of crystals, or in liquor ferri chloridi, as a styptic and astringent to arrest hemorrhage from surfaces or organs accessible for its local application.

Usually, a solution representing about 20 per cent. of its weight of hydrous ferric chloride is used, or still more dilute for use in spray. It arrests bleeding by coagulating the blood in the mouths of the vessels; also used as a local stimulant and astringent to unhealthy tissue with ulceration or tendency thereto, to condense the structure and correct fetor.

Internally, it is employed in tincture or solution of corresponding strength in doses of gtt. v. to xx. = gm. 0.33 to 1.33, in anæmic conditions accompanying or following profuse discharges, as hemorrhages, leucorrhœa, fluxes, etc., when the tongue is pale, broad, and flabby, and there are no symptoms of gastric irritation. Also as a special remedy in erysipelas, when the surface is dark-red, mucous surfaces relaxed, full, and of same dark-red color. Dose as above, often repeated.

FERRI CITRAS, $\text{Fe}_2, 2\text{C}_6\text{H}_5\text{O}_7, 6\text{H}_2\text{O}$. M. wt. 598.

Citrate of Iron. Ferric Citrate.

The pure salt, in scales of a garnet-red color, which yield, when completely incinerated, 26 per cent. of ferric oxide (Fe_2O_3).

Solubility.—It dissolves slowly in cold, freely and quickly in hot water; insoluble in alcohol.

Tests.—*Ferric tartrate*; completely precipitate a portion of a solution with liquor potassæ, filter, and add to the clear liquid a slight excess of acetic acid; a white, granular precipitate indicates tartrates. *Ammonio-ferric tartrate*; odor of ammonia on moistening with liq. potassæ and heating. *Potassio-ferric tartrate*; alkaline reaction of residue obtained by complete incineration on platinum foil.

Preparations.—Liquor Ferri Citratis. A solution, specific gravity 1.260, representing in each 100 parts the ferric citrate, produced by completely saturating with ferric hydrate, citric acid, *thirty parts*. It contains 35 per cent. of anhydrous ferric citrate (approximate). One fluidrachm should yield 30 grains of scales on evaporation and drying on glass.

Uses.—Useful when iron is indicated, in cases of children and patients with irritable stomachs. (See *Iron*.)

Dose.—Grs. j. to xx. = gm. 0.06 to 1.33.

The Liquor Ferri Citratis is a convenient form for use.

FERRI ET AMMONII CITRAS. Citrate of Iron and Ammonium. Ammonio-ferric Citrate.

The pure salt in dark-red, non-deliquescent scales, of sweetish taste and neutral reaction. Its composition is uncertain, but it is probably, as usually prepared, a mixture of ammonio-ferric citrate and ferric oxycitrate. It should yield, on complete incineration, 27 per cent. of ferric oxide (Fe_2O_3).

Solubility.—Soluble in water, glycerine, and diluted alcohol; insoluble in ether and strong alcohol.

Tests.—Same as with ferri citras, from which it may be distinguished by giving an ammoniacal odor on heating with liquor potassæ.

Uses and Dose.—Same as Ferri citras, which see.

FERRI ET AMMONII SULPHAS, $\text{Fe}_2\text{3SO}_4, (\text{NH}_4)_2\text{SO}_4.24\text{H}_2\text{O}$. M. wt. 964. Ammonio-ferric Alum.

The pure salt in pale-violet colored crystals, which lose water of crystallization when warm, and gradually decompose on exposure to the air.

Solubility.—Soluble in cold (4 parts) and in its own weight of boiling water; somewhat soluble in glycerine; insoluble in chloroform, alcohol, and ether.

Tests.—*Alum*; boil with liquor potassæ, filter, acidulate the filtrate with hydrochloric acid, and add excess of ammonium hydrate; a white gelatinous precipitate indicates alum.

Uses.—Same as with other astringent preparations of iron, as in mucous fluxes of bowels, vagina, etc. (See *Ferri Chloridum*.)

Dose.—Grs. v. to xv. = gm. 0.33 to 1.00.

FERRI ET AMMONII TARTRAS, $2(\text{FeO})\text{NH}_4\text{C}_4\text{H}_4\text{O}_6 \cdot 5\text{H}_2\text{O}$.
M. wt. 566. Tartrate of Iron and Ammonia. Ammonio-ferric Tartrate.

The salt in transparent red scales, yielding, by incineration, 29 per cent. of ferric oxide (Fe_2O_3).

Solubility.—Soluble in glycerine and water; insoluble in alcohol and ether.

Tests.—*Other metals*; precipitate a solution with liquor potassæ, filter, acidulate with hydrochloric acid, and pass sulphuretted hydrogen through the liquid; a turbidity indicates metals, the color of which will suggest the impurity. The solution, after precipitation with liquor potassæ should yield, on over-saturation with acetic acid, a white granular precipitate of potassium bitartrate. Boiled with liquor potassæ, ammonia should be evolved.

Uses.—Same as with citrates (which see), but contains less iron.

Dose.—Grs. v. to xxx. = gm. 0.33 to 2.00.

FERRI ET POTASSII TARTRAS. Potassic Ferric Tartrate.
Tartrate of Iron and Potassium.

The salt in transparent red scales, resembling ammonio-ferric tartrate in appearance, taste, and properties. When incinerated, it leaves an ash, which reacts alkaline and effervesces with acids. Its composition is somewhat uncertain.

Solubility.—Freely soluble in glycerine and water; insoluble in alcohol.

Tests.—It responds to the same tests as ammonio-ferric tartrate, except that it leaves an alkaline ash, and evolves ammonia gas on heating with liquor potassæ. The latter treatment causes the separation of ferric hydrate, which should not, however, precipitate before heating. The amount of ferric oxide (Fe_2O_3) produced by incineration will vary with different samples, due to variations in the steps of the process of preparation.

Uses.—A mild, agreeably-tasting ferruginous preparation, not apt to oppress the stomach or produce constipation.

Dose.—Grs. j. to xv. = gm. 0.06 to 1.00.

FERRI ET QUINIÆ CITRAS. Citrate of Iron and Quinia.
Quinia, Ferric and Ammonium Citrates.

The mixed salts, in scales of a greenish-yellow color, and containing not less than 12 per cent. of quinia.

Solubility.—Soluble in water; insoluble in alcohol and ether.

Tests.—Fifty grains should yield, with excess of aqua ammonia added to its solution, a white precipitate, which, when washed and dried, should weigh 8 grains, and be soluble in 6 fluidrachms of ether.

Its taste is bitter, which distinguishes it from other scaled ferric salts, which have a sweetish taste, and yield brown precipitates, or none at all, with ammonia.

Uses.—A convenient form of administering iron and quinia.

Dose.—In pill or solution, grs. j. to v. = gm. 0.06 to 0.33.

FERRI ET STRYCHNIE CITRAS. Citrate of Iron and Strychnia.

A mixture of ammonio-ferric citrate with strychnia citrate. It is prepared in scales closely resembling ammonio-ferric citrate, but is bitter in taste, and contains one per cent. of strychnia.

Solubility.—Freely soluble in water, glycerine, and diluted alcohol; insoluble in strong alcohol and ether.

Tests.—It should yield a white precipitate on adding ammonium hydrate, which should dissolve in hot alcohol, and crystallize on concentration and cooling. The crystals should give reactions for strychnia.

Uses.—In doses of grs. j. to ij. = gm. 0.06 to 0.13, in cases in which there is a supposed advantage in the conjoined action of iron and strychnia.

FERRI FERROCYANIDUM, $\text{Fe}_4\text{3Fe}(\text{CN})_6\cdot 18\text{H}_2\text{O}$. M. wt. 1184.

Ferric Ferrocyanide. Ferrocyanide of Iron.

The pure salt in dark-blue masses, which are hard, brittle, and yield a deep blue tasteless powder.

Solubility.—Insoluble in water, alcohol, and glycerine. With one-sixth of its weight of oxalic acid, it dissolves in water, forming a solution used as a wash-blue and ink. It dissolves in concentrated sulphuric acid without decomposition, and is reprecipitated on dilution with water. Hydrochloric and nitric acids, when strong, decompose the salt, as do also alkaline hydrates and carbonates.

Tests.—*Barium and calcium sulphates*; heat a portion of the salt to low redness, dissolve in pure hydrochloric acid; a residue indicates admixture. *Carbonates*; effervescence on solution in dilute hydrochloric acid. *Alumina and ferric hydrate*; precipitate on adding aqua ammonia to preceding solution; white if alumina only, or brown if ferric hydrate is present. *Calcium salts*; to filtrate from preceding

test, add oxalate of ammonia; a white precipitate indicates calcium. *Metals*; to the solution obtained by the *first* test, add a little potassium chlorate, and boil until the liquid has no odor of chlorine, dilute, filter, and to one portion of the liquid add liquor potassæ, and to another aqua ammoniæ, filter both liquids, and add sulphide of ammonium. *Lead*; a black precipitate in the potash solution. *Copper*; brown or nearly black precipitate with blue coloration of liquid in ammoniacal solution. *Zinc*; white precipitate in either liquid.

Uses.—The special utility of this preparation of iron is open to question, though it is recommended in the treatment of remittent and intermittent fevers, epilepsy, and neuralgia. It has usually been given with quinine.

Dose.—Grs. j. to v. = gm. 0.06 to 0.33.

FERRI OXIDUM HYDRATUM, $\text{Fe}_2\text{6HO}$. M. wt. 214.

Ferric Hydrate. Hydrated Oxide of Iron.

The ferric hydrate in the form of a brown-colored, homogeneous pulp. It should be recently prepared, avoiding elevation of temperature of the ingredients.

Solubility.—Insoluble in water, wholly soluble without effervescence in diluted hydrochloric acid.

Uses.—Its chief use is as a chemical antidote to arsenic, with which it forms an insoluble compound. To be efficacious, it must be freshly prepared, and either of the following extemporaneous methods will serve the purpose:

Take of Solution of ferric chloride, *two parts*, or tincture, *6 parts*.

Sodium carbonate, *1 part*, or sufficient.

Dissolve the sodium carbonate and add to the iron solution until effervescence and precipitation ceases; pour the mixture into a piece of muslin and squeeze out as much of the liquid as possible, then administer the moist residue, or

Take of Solution ferric chloride or sulphate, *2 parts*.

Calcined magnesia, $\frac{1}{4}$ *part*.

Mix the magnesia with water and then with the iron solution. Administer the mixture, or

Take of Solution of ferric sulphate, *2 parts*,

Water of ammonia, sufficient.

Dilute the iron solution with water, *eight parts*, and add the ammonia water with constant stirring until the mixture has a slight perma-

ment odor of ammonia; pour it on a muslin strainer, squeeze out the liquid, add more water; repeat the operation and then administer the residue. Substituting ounce for part in above, the quantities given will render 10 grains of arsenic insoluble. Emetics should be given and the stomach-pump used as soon as possible.

FERRI HYPOPHOSPHIS, $\text{Fe}_2\text{6PH}_2\text{O}_2$. M. wt. 502.

Hypophosphite of Iron. Ferric Hypophosphite.

The pure salt as a greenish-white, odorless, and nearly tasteless powder.

Solubility.—Insoluble or but slightly soluble in water. Soluble in diluted acetic and hydrochloric acids, solutions of ferric sulphate, and sodium hypophosphite. Partially soluble in hypophosphorous acid.

Tests.—*Ferric phosphate*; residue on treating with dilute acetic acid. *Calcium salts*; white precipitate from solution with oxalate of ammonium.

Uses.—Useful in anæmic and chlorotic conditions, especially when emaciation is marked; also in nutritive derangements from loss of fluids, spermatorrhœa, leucorrhœa, etc.

Dose.—Grs. j. to v. = gm. .06 to 0.33.

FERRI IODIDUM, FeI_2 . M. wt. 310. **Ferrous Iodid. Iodide of Iron.**

The pure salt in gray plates or laminated, deliquescent masses, of metallic lustre, crystalline fracture, and fusing at 177°C . (350°F .), with partial decomposition and emission of vapors of iodine. It rapidly oxidizes, and should, therefore, be used in the form of preparation hereafter mentioned.

Solubility.—Soluble, when pure, in alcohol, glycerine, and water, forming a yellowish-green solution.

Tests.—When its solutions have changed to a brown color decomposition has begun. If the addition of a little starch paste causes a blue color it indicates free iodine. Exposure to direct sunlight will restore the color of the syrup when it has become dark, or will prevent the change in the original solution.

Preparations.—Syrupus Ferri Iodidi, or Syrup of Ferrous Iodide, $\frac{\text{N}}{10}$.

A syrup, of pale-green color, containing 10 parts of ferrous iodide to each 100 parts of the preparation.

Ferri Iodidum Saccharatum, or Saccharated Ferrous Iodide, $\frac{\text{N}}{5}$.

A yellowish-white powder, containing 20 per cent. of ferrous iodide,

preserved by powdered sugar of milk. It dissolves in 7 parts of water, forming a clear solution (U. S. P.).

Uses.—Used in anæmia, of serofulous, syphilitic, or tubercular origin, especially when accompanied with enlargement of the lymphatic glands or infiltration of connective tissue.

Dose.—Of saccharated iodide of iron, grs. j. to x. = gm. 0.06 to 0.66, or syrup, double the amount. Should be given after meals, and largely diluted with water. The mouth should be rinsed after each dose to avoid injury to the teeth.

FERRI LACTAS, $\text{Fe}_2\text{C}_3\text{H}_5\text{O}_3 \cdot 3\text{H}_2\text{O}$. M. wt. 288.

Ferrous Lactate. Lactate of Iron.

The pure salt in yellowish-green powder, which blackens on heating, and leaves, on complete incineration, a residue of ferric oxide.

Solubility.—Soluble in cold (48 parts) and boiling (12 parts) water; insoluble in cold alcohol.

Tests.—*Alkaline salts* are present when the residue, after incineration, changes red litmus paper to blue. *Citric, malic, tartaric, sulphuric*, and *hydrochloric acids*; white precipitate, more than a mere turbidity, on adding solution of plumbic acetate to a solution of the salt.

Uses.—A mild, unirritating salt, convenient for use in similar cases with the scaled preparations of iron. It readily oxidizes when in solution, and, therefore, should be given in pill, or powder or recently-prepared solution.

Dose.—Grs. j. to v. = gm. 0.06 to 0.33.

FERRI OXALAS, $\text{FeC}_2\text{O}_4 \cdot \text{H}_2\text{O}$. M. wt. 162.

Ferrous Oxalate. Oxalate of Iron.

The pure salt in pale-yellow crystalline powder, yielding, by incineration, not less than 49.3 per cent. of ferric oxide (Fe_2O_3).

Solubility.—It requires 4500 parts of water to dissolve it. Insoluble in alcohol; soluble in hydrochloric and sulphuric acids.

Uses.—It has no well-defined medicinal virtues. It has been used in doses of grs. j. to ij. = gm. 0.06 to 0.13.

FERRI OXIDUM MAGNETICUM, $\text{FeO}, \text{Fe}_2\text{O}_3$. M. wt. 232.

Ferro-ferric Oxide. Hydrated Magnetic Oxide of Iron.

The chemical in the form of a dark or brownish-black powder, which dissolves without effervescence in a mixture of equal parts of hydro-

ehlorie acid and warm water. It is attracted by the magnet, and loses water when heated. A long continued high temperature finally converts it into ferrie oxide (Fe_2O_3). In composition, it is a mixture of ferrous and ferrie hydrates, more or less oxidized during the process of preparation and drying.

Solubility.—Soluble in acids only.

Tests.—It should be completely soluble in hydroehlorie acid, and the solution should give a blue precipitate with both potassium ferrocyanide and ferrieyanide; and a white turbidity only, with sulphuretted hydrogen. *Copper*; dark turbidity with sulphuretted hydrogen to acid solution. *Sulphates, chlorides, etc., from imperfect washing*; white precipitates on adding solution of barium ehloride (sulphates), or silver nitrate (ehlorides), to a solution obtained by agitating the powder with water, filtering, and acidulating with acetic acid. *Lead and zinc*; black (lead) or white (zinc) precipitate on adding solution of sulphhydrate of ammonium to a solution prepared by boiling some of the ferro-ferrie oxide with liquor potassæ, and filtering.

Uses.—On account of its more ready solubility in the stomach, and its freedom from irritating effects, this preparation is to be preferred to the subearbonate (?) in similar cases.

Dose.—Grs. j. to x. = gm. 0.06 to 0.66.

FERRI PEROXIDUM HYDRATUM, $\text{Fe}_2\text{O}_2 \cdot 2\text{HO}$. M. wt. 178.

Hydrated Peroxide of Iron. Ferric Oxyhydrate.

The chemical obtained from Ferri oxidum hydratum, or moist ferrie hydrate, by drying it at a temperature not exceeding 100°C . (212°F). By this treatment it loses water, absorbs oxygen, and changes from ferrie hydrate to a ferrie oxyhydrate. It is official in the British Pharmacopœia.

Uses.—Ferrie oxyhydrate must not be confounded with the ferrie hydrate used as an antidote to arsenic, as it possesses no such power. It is occasionally used internally, but on account of its bulk and insolubility, it is not considered an eligible preparation.

Dose.—Grs. x. to xv. = gm. 0.66 to 1.00.

FERRI PHOSPHAS, $\text{Fe}_32\text{PO}_4 \cdot \text{FePO}_4 \cdot 12\text{H}_2\text{O}$. M. wt. 725.

Ferroso-ferrie Phosphate. Phosphate of Iron.

[Ferri Phosphas, U. S. P., is *ferrie* phosphate.]

The pure chemical as a slate-blue, amorphous, tasteless, and odorless

powder. When freshly precipitated before drying it is ferrous phosphate (Fe_32PO_4).

When dried it has the composition indicating it to be a mixed ferrous and ferric phosphate.

Solubility.—Insoluble in water, soluble in mineral acids.

Tests.—*Copper*; black precipitate or turbidity on standing after passing sulphuretted hydrogen through a solution of the phosphate in hydrochloric acid. *Arsenic*; yellow precipitate from preceding test, or arsenic deposit on a piece of bright copper digested with the same solution. *Sodium sulphate*; white precipitate on adding solution of barium chloride to hot water which has been digested with some of the phosphate and then filtered.

Uses.—Used in anæmia and impoverished conditions of the blood, associated with imperfect nutrition.

Dose.—Grs. j. to v. = gm. 0.06 to 0.66, in powder or pill form.

FERRI PHOSPHAS ALBA, $\text{Fe}_22\text{PO}_4.4\text{H}_2\text{O}$. M. wt. 374. Ferric Phosphate. White Phosphate of Iron.

The pure salt as a white powder.

Solubility.—Insoluble in water, soluble in solutions of alkaline citrates, forming green-colored liquids; soluble also in citric, tartaric, and dilute mineral acids.

Tests.—*Chloride of sodium* (from imperfect washing); white precipitate with silver nitrate when added to solution of ferric phosphate in diluted nitric acid.

Metals.—See tests under ferri phosphas. Should be soluble as above indicated.

Uses.—Same as in case of ferri phosphas, and in same doses. May be dissolved with phosphoric, citric, or tartaric acid, and made into a syrup with sugar. [Ferri phosphas, U. S. P., is ferric phosphate dissolved in solution of sodium citrate, evaporated and sealed as with ferri pyrophosphas. Contains 13.5 per cent. of metallic iron.]

FERRI PYROPHOSPHAS. Ferric Pyrophosphate with Citrate of Ammonium. Pyrophosphate of Iron.

The preparation in apple-green scales, of a feebly saline, mildly ferruginous, and slightly acid taste. Its composition is uncertain, but it is probably a mixture of ammonio-ferric pyrophosphate ($\text{Fe}_43\text{P}_2\text{O}_7, 3(\text{NH}_4)_4\text{P}_2\text{O}_7$), with ammonio-ferric citrate and ferric citrate. True

ferrie pyrophosphate ($\text{Fe}_4\text{3P}_2\text{O}_7$) is a white, tasteless powder, insoluble in water, but soluble in alkaline citrates. Such a solution in ammonium citrate, evaporated and sealed, forms the pyrophosphate of iron of pharmacy, and represents 48 per cent. of anhydrous pyrophosphate, or 11.5 per cent. of metallic iron.

Solubility.—Freely soluble in water and glycerine; insoluble in alcohol.

Tests.—*Alteration by exposure*; loss of solubility and transparency. When its solution is acidulated with acetic acid, it should yield a dense white precipitate on addition of solution of silver nitrate.

Uses.—This is one of the most eligible of the preparations of iron on account of its ready solubility, and freedom from unpleasant taste.

Dose.—Grs. j. to x. = gm. 0.06 to 0.66.

FERRI SUBCARBONAS. Subcarbonate of Iron.

The chemical as a reddish-brown, odorless, and tasteless amorphous powder. It is composed mainly of ferrie oxyhydrate ($\text{Fe}_2\text{O}_3 \cdot \text{Fe}_26\text{HO}$), with a small amount of ferrous carbonate (FeCO_3); it is very similar to ferri peroxidum hydratum, but is more readily soluble in acids with which it effervesces slightly. The solution gives a blue precipitate with solution of ferricyanide of potassium, indicating the presence of some ferrous salt.

Solubility.—Insoluble in water, soluble with slight effervescence in diluted hydrochloric acid, forming a yellow solution.

Tests.—*Sulphates from imperfect washing*; white turbidity on adding solution of barium nitrate to water which has been warmed with some of the powder, and then filtered. *Copper*; bluish tint of liquid on adding sulphhydrate of ammonium to a solution of carbonate of ammonium in which some of the powder has been digested. *Zinc*; white precipitate from foregoing test.

Uses.—Same as ferri peroxidum hydratum, and the other insoluble iron salts.

Its utility as an antidote to arsenic is questionable, and it should not be depended on for this purpose. (See *Ferri Oxidum Hydratum*.)

FERRI SULPHAS, $\text{FeSo}_4 \cdot 7\text{H}_2\text{O}$. M. wt. 278.

Ferrous Sulphate. Sulphate of Iron.

The pure salt in crystals of a bluish-green color, or in pale-green crystalline powder (ferri sulphas granulata), specific gravity 1.9; somewhat styptic in taste, of acid reaction and efflorescent in air, which also

gradually oxidizes it. It contains 45.3 per cent. of water of crystallization.

Solubility.—Soluble in less than two parts of water at ordinary, and in still less at higher, temperatures. It is insoluble in ether or alcohol.

Tests.—*Copper*; black precipitate by sulphuretted hydrogen to aqueous solution slightly acidulated with sulphuric acid. Metallic film on bright blade of a spatula immersed for a few hours in the solution. *Alkalies and magnesium*; completely precipitate an aqueous solution with sulphhydrate of ammonium, filter, evaporate filtrate to dryness, and heat to redness—a residue indicates magnesium or alkalies. *Zinc, manganese*; filter the liquid from the first test, boil to expel sulphuretted hydrogen, add a few drops of nitric acid, evaporate nearly to dryness, dissolve in water, add excess of ammonium hydrate and filter; through the filtrate pass sulphuretted hydrogen—a white precipitate indicates zinc, a reddish-white one manganese.

Uses.—See *Dried Sulphate of Iron*.

FERRI SULPHAS EXSICCATUS, $\text{FeSO}_4 \cdot \text{H}_2\text{O}$. M. wt. 170.

Dried Sulphate of Iron.

Ferrous sulphate which has been dried at a temperature of 300° until it ceases to lose weight. About 6 parts of dried represent 10 parts of the crystallized salt. It forms a grayish-white powder.

Solubility.—Slowly soluble in cold, rapidly in hot, water; a small residue of oxysulphate usually remains.

Tests.—See *Ferri Sulphas*.

Uses.—Crystallized ferrous sulphate, or an equivalent quantity of the dried salt, is occasionally used internally to restrain excessive discharges, caused by debility of the secreting surfaces, as in diarrhœa of a chronic character, hydruria, leucorrhœa, etc.; also as a direct capillary astringent in cases of passive hemorrhage, and locally in certain skin diseases with hyperæmia of the part.

Dose.—Grss. j. to ij. = gm. 0.06 to 0.13 of the crystallized salt. Locally, the dried salt in ointment (2 parts to simple ointment or lard, 30 parts), or in solution (one-half oz. to pint).

FERRI SULPHIDUM, FeS . M. wt. 88. Ferrous Sulphide.

Sulphide or Sulphuret of Iron.

The sulphide in irregular fragments of steel color and metallic lustre. When quite pure it has a yellowish color.

Solubility.—It is soluble in dilute sulphuric or hydrochloric acids, with evolution of sulphuretted hydrogen (H_2S . M. wt. 34).

Uses.—Used for the preparation of sulphuretted hydrogen, which is employed as a reagent for metals. This gas is soluble in three times its volume of water, but the solution rapidly decomposes. Not used medicinally.

FERRUM DIALYSATUM. Dialyzed Iron.

A nearly tasteless, transparent liquid, of dark reddish-brown color, specific gravity 1.040. 100 parts yield, when evaporated on a water-bath, a residue which, when pulverulent, weighs 5 parts. Its composition varies with the mode of preparation from $Fe_2Cl_6 \cdot 11Fe_2O_3$ to $Fe_2Cl_6 \cdot 31Fe_2O_3$. A basic ferric oxychloride forming a solution having the characters above described, will fill all requirements for medicinal use.

Solubility.—It mixes with alcohol, syrup, glycerine, and distilled water, but is decomposed by saline solutions or by ordinary spring water; it decomposes also by evaporation to dryness, or by the addition of acids or alkalies.

Uses.—The real value of this preparation of iron may be considered as yet undetermined, although the most extravagant claims have been made for it in all the cases in which iron is indicated. As it is nearly tasteless, does not injure the teeth or constipate the bowels, it is a desirable form for administration, should further study determine its true value.

As an antidote for arsenic, it does not appear to be as reliable as ferric hydrate, although it may be used when the latter is not available. When given for this purpose, it should be followed by a teaspoonful of common salt.

Dose.—Gtt. v. to 3j. = gm. 0.33 to 4.00.

FERRUM PULVERATUM. Pulverized Iron.

Pure, powdered cast-iron in the form of a dense, gray powder of dull, metallic appearance, and which, when heated, oxidizes, gains in weight, and forms a reddish powder.

Solubility.—Soluble in diluted hydrochloric or sulphuric acid with evolution of hydrogen gas, and leaving but a slight residue of carbon.

Tests.—*Lead, copper, etc.*; dark color or precipitate on passing sulphuretted hydrogen through a solution of the iron in equal parts of hydrochloric acid and water. The solution in acid should be light-green.

when filtered, and should give, when highly diluted, a deep blue turbidity on addition of solution of ferricyanide of potassium, and white precipitates (rapidly becoming green) on adding alkaline hydrates and carbonates. The hydrogen evolved on solution in acid should not discolor a bunch of cotton, moistened in solution of plumbic acetate, and inserted in the mouth of the test-tube in which solution is effected.

Uses.—See *Ferrum Reductum*, for which it is often substituted in the same dose.

FERRUM REDUCTUM. Reduced Iron.

Iron obtained by reduction of ferric oxyhydrate by hydrogen at a strong heat.

A very fine, grayish-black powder, without metallic lustre, but exhibiting lustrous streaks when rubbed in a mortar. It is soluble in 25 times its weight of solution of chloride of iron, specific gravity 1.300. It ignites when touched with a lighted taper and burns to brown ferric oxide.

Solubility.—Soluble without residue in warm, diluted, pure hydrochloric acid, forming a green solution, pure hydrogen being given off. Soluble also in diluted sulphuric acid, but is unaffected by neutral or alkaline solvents.

Tests.—*Sulphides*; odor of sulphuretted hydrogen to gas given off on solution in acid, or discoloration of cotton dipped in solution of plumbic acetate when exposed to the gas. *Carbon*; residue on treatment with warm, dilute hydrochloric acid. *Ferric oxide*; yellowish color of filtered acid solution, which also strikes a deep-red color with solution of sulphocyanide of potassium. *Copper, lead, etc.*; dark color or precipitate from acid solution with sulphide of ammonium.

On digesting 0.5 *parts* of reduced iron in a solution of 1.1 *parts* of iodine, and 1.1 *parts* of iodide of potassium, in 25 *parts* of water for two hours, the liquid should not give reaction for free iodine on addition of starch paste, and not over 50 per cent. of the iron should remain undissolved (black oxide).

Uses.—*Ferrum reductum* and *ferrum pulveratum* are the most eligible forms for the administration of metallic iron. Both are dissolved by the gastric acid, hydrogen being evolved; the latter causes unpleasant eructations when the iron is impure or is given in too large doses. It should be given immediately after eating, in powder or suspended in water.

Dose.—Grs. j. to v. = gm. 0.06 to 0.33.

FŒNICULUM. Fennel.

The fruit of *Fœniculum vulgare*.

Umbelliferæ, Orthospermæ.

Bentley and Trimen.

Constituents.—*Fixed oil* (12.5 per cent.), *volatile oil* (2 to 4 per cent.), and *sugar*. The volatile oil, *Oleum Fœniculi*, is the active constituent; it is neutral, colorless, or straw-yellow, of specific gravity .96 to .99, congeals below 10° C. (50° F.), but varies somewhat in this last respect, owing to the presence of variable amounts of the camphor-like hydrocarbon, anethol ($C_{10}H_{12}O$), and a hydrocarbon isomeric with ol. turpentine ($C_{10}H_{16}$). It is freely soluble in alcohol.

Preparations.—A medicated water, $\frac{N}{500}$, from the oil, as in Sec. 15, Part I.

A tincture, $\frac{N}{50}$, from the oil, as follows:

Take of Oil of fennel, <i>two parts</i>	.	.	.	.	.	.	2
Alcohol, <i>ninety-eight parts</i>	.	.	.	.	.	.	98

Dissolve the oil in the alcohol.

Uses.—The seeds are employed, in hot infusion, to relieve flatulence and as a carminative. It increases secretion from skin, kidneys, and glands, generally. The oil or its tincture, for similar purposes.

Dose.—Of the infusion (3j. = gm. 4.00 to boiling water 3viij. = gm. 250), a teaspoonful to a wineglassful.

Of the oil, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent.

FŒNUM GRÆCUM. Fenugreek.

The seeds of *Trigonella fœnum græcum*.

Leguminosæ, Papilionacæ.

Linné. Bentley and Trimen.

Constituents.—*Fixed and volatile oil, mucilage, albumen, a bitter principle*, and a small amount of tannin.

Uses.—In powder, for similar purposes and in the same manner as ground flaxseed, elm, and mallow root, for cataplasms, and internally as an emollient. Largely employed in patent "horse and cattle powders."

FRASERA WALTERI. American Columbo.

The fresh root. (*F. Caroliniensis. Walter.*)

Gentianacæ.

Michaux.

Constituents.—*Gentisic acid* ($C_{14}H_{10}O_5$) and *gentiopicrin* ($C_{20}H_{30}O_{12}$); the former is but slightly dissolved by alcohol, ether, and water, and forms tasteless yellow crystals; the latter, a glucoside, very soluble

in water and alcohol, insoluble in ether. Both are found in the *Gentiana lutea*, which, however, contains more of the bitter principle gentiopierin. *Frasera* also contains *tannin*, *pectin*, and *sugar*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A powdered extract, $\frac{4N}{1}$, with alcohol, from the dry root, as in Sec. 20, Part I.

Uses.—In the dried state this drug has been used principally as a tonic in relaxed and catarrhal conditions of the digestive organs to excite appetite and promote digestion. In this respect its action may be deemed identical with that of gentian, although it is not so bitter. In the fresh state it will produce both vomiting and purgative effects. Its use is suggested in atonic dyspepsia and chronic gastric catarrh with occasional vomiting or constipation alternated with diarrhœa. Small doses will prove sufficient.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to iij. = gm. 0.06 to 0.20, or equivalent.

FRAXINUS AMERICANA. White Ash.

The recent bark of the root.

Oleaceæ, Fraxinææ.

Gray.

Constituents.—These have not been investigated.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—As a laxative in constipation, and as a remedy for enlargement of the spleen, and in dropsical conditions. It deserves careful study.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to 3j. = gm. 0.66 to 4.00, or equivalent.

The *Fraxinus sambucifolia*, or black ash, possesses astringent and tonic properties, and may be prepared as in case of the *F. Amer.*, and used in similar doses.

FRAXINUS EXCELSIOR. European Ash.

The recent bark of the branches.

The mature fresh leaves.

Oleaceæ, Fraxinææ.

Linné.

Constituents.—The bark contains the glucoside, *fraxin* ($C_{32}H_{36}O_{20}$), bitter, soluble in alcohol, water, and alkalies; *tannin* and *mannite*. The leaves yield a non-crystalline, purgative principle, *fraxinit*, and *malate of calcium*.

Preparations.—From both leaves and bark.

A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—These are not well defined, but deserve investigation. The bark has some European reputation in intermittents. The leaves have been successfully used in gout and articular rheumatism; they are somewhat purgative.

Dose.—Tincture, $\frac{N}{I}$, of the leaves or bark, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent, three times a day.

FUCUS VESICULOSUS. Bladder Wrack.

The dried plant.

Algæ, Fucoidæ.

Linné.

Constituents.—A bitter principle, odorous oil, mannite, and mucilage. Its ash contains iodine, bromine, and salts.

Preparations.—A tincture, $\frac{N}{I}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 44, Part I.

An extract with alcohol, as in Sec. 19, Part I.

Uses.—There seems to be some evidence of the utility of this drug in causing the absorption of fat in cases of obesity. The recognition of the condition in which it will prove remedial is, in the present state of our knowledge, not possible. For this reason it is given on purely empirical grounds, with some successful results, but more failures.

Dose.—Tincture, $\frac{N}{I}$, gtt. xxx. to 3j. = gm. 2.00 to 4.00, or equivalent.

FUMARIA OFFICINALIS. Fumitory.

The fresh plant in flower.

Fumariaceæ.

Linné.

Constituents.—An alkaloid, *fumarina*, white, bitter, crystalline, soluble in alcohol, slightly in water; *fumaric acid* ($C_4H_4O_4$), crystalline and sublimable. The usual constituents of plants are also present.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—A remedy for imperfect digestion due to torpor of the bowels, and for some skin diseases of scrofulous origin, as *crusta lactea*. The nature and range of its action are not well defined.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to 3j. = gm. 0.33 to 4.00, or equivalent. Used topically also.

GALANGA. Galangal.

The rhizome of *Alpinia officinarum*.

Zingiberaceæ.

Hance.

Constituents.—Aerid soft *resin*, soluble in alcohol and ether; *volatile oil*. The oleo-resin obtained by ether contains a crystalline principle, *kaempferid*, which is, when pure, yellowish, tasteless, and inodorous.

Preparations.—A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—A remedy closely resembling ginger in its action and uses. Principally used as a stimulant to the gastric and gastro-intestinal membranes, to allay nausea, promote digestion, and relieve flatulence. Locally, in powder used as a snuff, it is useful in relaxed and catarrhal conditions of the surfaces of the nares and of the soft tissues of the oral cavity.

Dose.—Tincture, $\frac{N}{2}$, gtt. v. to xxx. = gm. 0.33 to 2.00, in some bland vehicle, as milk, mucilage, syrup, or diffused in water.

GALBANUM. Galbanum.

The gum resin of *Ferula galbaniflua* in tears. *Boissier et Buhse.*

Umbelliferæ, Orthospermæ.

Bentley and Trimen.

Constituents.—Yellowish-brown *resin*, soluble in alcohol and ether, and yielding, when treated with fused potassic hydrate, volatile, fatty acids and resorein; *umbelliferon* ($C_9H_6O_3$), soluble in alcohol, ether, and hot water, and forming, when pure, colorless, rhombic crystals; when heated with hydrate of potassium, it also yields resorein; its solutions are blue in reflected light; colorless *volatile oils*, which become thick and yellowish on exposure, and volatile *fatty acids*.

Uses.—This drug is rarely employed alone, but has proven useful as a stimulant to mucous surfaces when a relaxed and catarrhal condition is present.

Dose.—Grs. ij. to xv. = gm. 0.13 to 1.00, in emulsion, or with a bland vehicle.

GALIUM APARINE. Cleavers.

The recent herb.

Rubiaceæ, Stellatæ.

Linné.

Constituents.—An odorous principle, *coumarin*; a *tannin* like body; a *bitter principle*; *citric, oxalic, and rubichloric* acids.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Used in dysuria; suppression; strangury in young children from colds, and in women from uterine irritation; irritability of the bladder from prostatic disease with old men, and to increase the flow of urine in rheumatic and other fevers.

Dose.—Tincture, $\frac{N}{i}$, gtt. x. to $\mathfrak{z}j$. = gm. 0.66 to 4.00, or equivalent.

GALLA. Nutgall.

The globular excrescence caused by the puncture and deposit of ova of *Cynips gallæ tinctoriæ* upon the *Quercus infectoria*. *De Condolle*.
Cupuliferæ. Bentley and Trimen.

Constituents.—*Gallotannic acid* (60 per cent.); *gallic acid* (2 to 3 per cent.); *resinous, starchy, saccharine*, and *albuminous matters*.

Preparations.—A tincture, $\frac{N}{\mathfrak{s}}$, with diluted alcohol, as in Sec. 48, Part I. [U. S. P.].

An ointment, $\frac{N}{\text{io}}$, from the powder with *Adeps benz.* as in Sec. 50, Part I.

Uses and Dose.—It is employed locally in infusion to correct relaxation of mucous membranes. It is the source from which tannic acid is prepared, and its properties may be considered nearly identical. (See *Acid, Tannic*.) Powdered nutgall, $\mathfrak{z}ss.$ to $\mathfrak{z}j$. = gm. 16 to 32 to boiling water $\mathcal{O}j$. = gm. 500, is used in doses of a wineglassful in diarrhœas, and as an antidote for poisonous alkaloids; also as a gargle or wash. The tincture, $\frac{N}{\mathfrak{s}}$, may be added to water and used for same purposes. Dose, gtt. j. to xxx. = gm. 0.06 to 2.00.

The ointment is used where a local astringent action is wanted, as in prolapsus of the rectum or vagina, or when piles exist.

GAMBOGIA. Gamboge.

The gum-resin obtained from *Garcinia Hanburii*, and known as pipe gamboge.

Guttiferæ.

Hooker. Bentley and Trimen.

Constituents.—*Gambogic acid* ($C_{26}H_{24}O_4$) of which there is present 65 to 72 per cent.; it is soluble in alcohol, ether, and weak alkaline solutions; gummy matters and accidental impurities are also present. The latter will remain as insoluble residue after treatment of the drug with alcohol and cold water. The same solvents serve also to detect other adulterations.

Preparations.—A tincture, $\frac{N}{\mathfrak{s}}$, with alcohol, as in Sec. 48, Part I. Triturations, as in Sec. 49, Part I.

Uses and Dose.—In large doses, it is a violent gastro-intestinal

irritant, causing profuse choleraic discharges, colic, and tenesmus. Where used as an evacuant it is usually associated with other purgatives in doses of grs. j. to iij. = gm. 0.06 to 0.20.

In minute doses, it is an important remedy in dysentery and diarrhœa, characterized by pinching pain in the umbilicus during the stool, which is profuse and watery, and often accompanied by vomiting and faintness.

The triturations, $\frac{N}{10}^2$ to $\frac{N}{10}^6$ = 3x. to 6x. in one-grain doses, or tincture, $\frac{N}{5}$, gtt. v. to x. = gm. 0.33 to 0.66 to water $\overline{\text{§iv.}}$ = gm. 128.00, teaspoonful (gm. 4.00) doses, are convenient forms for use.

GARCINIA MANGOSTANA. Mangosteen.

The dried rind of the fruit.

Guttiferæ.

Linné.

Constituents.—*Mangostin* ($C_{20}H_{22}O_5$), yellow, crystalline, soluble in alcohol and ether, and producing a green-black color with ferric salts; also *tannin*. The rind has a bitterish, astringent taste, but in the fresh fruit it incloses a white, juicy pulp of delicious flavor.

Preparations.—A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—An East Indian remedy for dysentery, diarrhœa, etc. Its astringent character has made it useful in relaxed and catarrhal conditions of other mucous surfaces, as of the throat, urethra, bladder, and vagina, and as a wash to ulcers, etc.

Dose.—Tincture, $\frac{N}{2}$, gtt. j. to v. = gm. 0.06 to 0.33, in dysentery, repeated frequently.

In other conditions, tincture, $\frac{N}{2}$, gtt. x. to $\overline{3j.}$ = gm. 0.66 to 4.00, or in decoction (Sec. 18, Part I.) locally, *ad lib.*

GAULTHERIA PROCUMBENS. Wintergreen.

The recent leaves.

Ericacææ, Ericinææ.

Linné. Bentley and Trimen.

Constituents.—A colorless, volatile oil, *Oleum Gaultheriæ*, specific gravity 1.18, soluble in alcohol, colored purple on adding ferric chloride solution, and forming, if pure, a mass of colorless crystals when mixed with pure nitric acid, and containing 90 per cent. of methyl salicylate ($CH_3C_7H_5O_3$), and a colorless hydrocarbon of agreeable aromatic odor and of the formula $C_{10}H_{16}$; a glucoside, *arbutin* ($C_{24}H_{32}O_{14} \cdot H_2O$), which forms neutral, colorless, needle-shaped crystals, soluble in alcohol and hot water; *ursone* ($C_{20}H_{34}O_2$), in crystalline needles, soluble

in boiling alcohol, slightly in cold, insoluble in water; *ericolin* ($C_{34}H_{56}O_{21}$), a glucoside, bitter, brownish-yellow, soluble in alcohol and water; an *astringent principle* analogous to gallic acid; *grape sugar*, *gum*, and *coloring matter*. (See *Chimaphila* and *Uva Ursi*.)

Preparations.—A tincture, $\frac{N}{I}$, from the leaves, as in Sec. 42, Part I.

A tincture, $\frac{N}{V}$, from the leaves, as in Sec. 45, Part I.

A tincture, $\frac{N}{IO}$, from the oil with alcohol, as in Sec. 46, Part I.

Uses.—Its most important use is to control cystic, prostatic, or urethral irritation and excitement of the sexual organs, which is often caused thereby. The oil possesses carminative properties, but is more often used as a flavoring agent for syrups; it is also antiseptic.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

Tincture of the oil, $\frac{N}{IO}$, gtt. v. to xx. = gm. 0.33 to 1.33, for colic, etc.

GELATINA. Gelatin.

The best quality of gelatin of commerce, soluble without change of color in hot water, forming, when cool, a tremulous jelly without odor or taste.

Solubility.—Freely soluble in hot water and nitrous ether; moderately in cold anhydrous glycerine; insoluble in alcohol and ether. It dissolves in dilute acetic acid, and in phosphoric acid solution which has been nearly neutralized by ammonium carbonate. A strong aqueous solution, to which is added $\frac{1}{5}$ or $\frac{1}{7}$ of its weight of nitric acid, remains liquid. When made with glue, these acid solutions are known as liquid glues. Solutions in water cease to gelatinize after prolonged boiling.

Tests.—Gelatin yields precipitates with tannin, corrosive sublimate, chlorine water, and platinic chloride, but its solution is unaffected by dilute solutions of plumbic subacetate, ferric chloride, or alum.

Chondrin, if present, precipitates the last three, and also diluted acetic and mineral acids. Solutions of gelatin should be colorless and odorless; they easily decompose.

Preparations.—Gelatin is employed for various pharmaceutical purposes, a detailed description of which would be out of place. The following are the most important:

Coating of pills and preparation of capsules for powders or for inclosing liquid substances, as in the so-called medicinal pearls. As a basis for medicated gelatin, prepared by drying a medicated solution of gelatin in the form of sheets of definite size and thickness, and so dividing as to represent a certain dose in each portion. As a basis for

suppositories (which see, Part I.) and soluble bougies, which differ only in shape.

Uses.—Although not of itself capable of supporting life, it is frequently used for artificial jellies containing sugar, wine, and spices, forming a grateful food during convalescence.

GELSEMIUM SEMPERVIRENS. Yellow Jessamine.

The fresh root.

Loganiaceæ.

Aiton. Bentley and Trimen.

Constituents.—An alkaloid, *gelseminia* ($C_{11}H_{19}NO_2$), which, when isolated, is white, amorphous, very bitter, alkaline, slightly soluble in water, soluble in ether and chloroform, freely so in dilute acids. *Gelseminic acid*, identical with *æsculin* ($C_{16}H_{16}O_9$) of the *æsculus hippocastanum*, and which is a glucoside, crystallizing in colorless prisms, but slightly soluble in cold water or ether, soluble in alcohol, and with dilute alkaline solutions, causing a characteristic fluorescence; *resin*, *volatile oil*, starch, gum, and pectin.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A powdered extract, $\frac{4N}{1}$, with alcohol, from the recent root, as in Sec. 20, Part I.

[Tinctura gelsemii, U. S. P. = $\frac{15N}{100}$.]

Uses.—The greatest remedial value of this drug is exhibited in states induced by exaltation of function of the cerebro-spinal nerve centres, and characterized by great nervous tension and exaggeration of both motility and sensibility. Among the symptoms indicating these conditions may be enumerated spasms, puerperal, tetanoid, choreaic, and hysterical; convulsive and spasmodic coughs; spasm of neck of the bladder, or of other sphincter muscles; nervous irritability, wakefulness, and restlessness; cerebral and cerebro-spinal hyperæmia, or inflammation with flushed face, brilliant eyes, contracted pupils; fevers, bilious, catarrhal or malarial, with symptoms given above; neuralgia of the fifth pair, ovarian neuralgia, dysmenorrhœa, etc.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent to water $\bar{5}$ iv. = gm. 128.00. Teaspoonful doses, gm. 4.00, every one-half to two hours, until the desired result is attained. The interval should be lengthened as its effects appear, and the drug discontinued should the eyelids become affected.

In paralytic conditions, general or special, and in passive congestion of the brain, the remedy, if used at all, must be given in minute doses,

and watched carefully, as large doses, or their too long continuance, aggravate the existing condition and endanger life.

GENISTA TINCTORIA. Dyer's Broom.

The recent young branches with leaves and blossoms.

Leguminosæ, Papilionaceæ.

Linné.

Constituents.—*Volatile oil* of a greenish-yellow color, yellow coloring matter, a bitter and acrid principle, which has not been examined, and the usual inert constituents of plants.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—The only property of this drug that has been utilized, is its power of promoting diuresis in dropsical conditions. The decoction has usually been used, but the tincture will be found more convenient. It deserves study.

Dose.—Tincture, $\frac{N}{2}$, gtt. v. to xxx. = gm. 0.33 to 2.00.

GENTIANA CATESBÆI. Blue Gentian.

The root (*G. puberula*. Michaux).

Gentianaceæ.

Gray.

Constituents.—So far as known they are identical with the *G. lutea*.

Preparations.—A tincture, $\frac{N}{1}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—This drug is considered to be identical in properties with the *G. lutea*. It deserves special investigation to determine its efficacy in mucous fluxes, diarrhœas, etc.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

GENTIANA LUTEA. Gentian.

The root.

Gentianaceæ.

Linné.

Constituents.—A bitter glucoside, *gentiopicrin* ($C_{20}H_{30}O_{12}$), which, when pure, is colorless or white, crystalline, soluble in alcohol and water; insoluble in ether, and is decomposed by alkaline and acid solutions; a substance known as *gentisic acid* (gentianic acid, $C_{14}H_{10}O_5$), which forms bright-yellow crystals, tasteless, but slightly soluble in alcohol (500 parts), ether (2000 parts), and water (5000 parts); a *volatile oil* in minute amount, *pectin*, and *sugar*.

Preparations.—A tincture, $\frac{N}{I}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

An extract with cold water, as in Sec. 19, Part I.

A powdered extract, $\frac{4N}{I}$, with alcohol, as in Sec. 20, Part I.

Uses.—The curative value of this remedy is most apparent in chronic catarrhal conditions of the gastro-intestinal tract, with relaxation of its mucous membrane. Judiciously used, it gives tone to the relaxed surfaces, and promotes the secretion of healthy gastric juice and of gastric and intestinal mucous; hence its use in atonic dyspepsia, characterized by an oppressed feeling in the epigastric region, with mental and physical depression; also in diarrhœas with relaxation of mucous membranes, and in cases of chronic malarial poisoning. Given too long, or in too large doses, it produces unhealthy secretion, and does harm. It is not adapted to acute mucous disorders.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent.

GENTIANA QUINQUEFLORA. Five-flowered Gentian.

The recent root.

Gentianaceæ.

Lamarck. Gray.

Constituents.—These have never been determined.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—These are analogous to those of *G. lutea* and *G. catesbæi*. The *G. quinq.* has recently been revived as a remedy of great value in chronic malarial troubles, and as a substitute for quinine.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xxx. = gm. 0.33 to 2.00, or equivalent.

GERANIUM MACULATUM. Cranesbill.

The rhizome.

Geraniaceæ.

Linné. ♀ Bentley and Trimen.

Constituents.—*Tannin* and *gallic acid* are the constituents of the most prominence. *Resin, gum, starch, pectin,* and *sugar* are also present.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{I}$, with alcohol, as in Sec. 20, Part I.

Uses.—As a pure astringent for both internal and local use. Espe-

cially valuable in diarrhœas, with stools containing mucus, relaxation of the mucous surfaces of the pharyngeal cavity, leucorrhœa, etc.

Dose.—Tincture, $\frac{N}{4}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent internally; locally, diluted, as a wash or gargle.

GERARDIA PEDICULARIA. Fever Weed.

The fresh plant in flower.

Scrophulariaceæ, *Gerardiæ*.

Linné. Gray.

Constituents.—These are not determined.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Not well defined. Has long been in use as a domestic remedy for the reduction of fevers, which it effects by producing perspiration. It is worth further study.

Dose.—Tincture, $\frac{N}{2}$, gtt. j. to x. = gm. 0.06 to 0.66.

GEUM RIVALE. Water Avens.

The rhizome and rootlets recently gathered.

Rosaceæ, *Dryadæ*.

Linné.

Constituents.—The plant has not been analyzed, but from its identical therapeutic action is supposed to have the same constituents as *G. urbanum*, which contains volatile oil, resin, tannin, fat, and others of no medicinal importance.

Preparations.—A tincture, $\frac{N}{4}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used in diseases of mucous membranes attended with relaxation, excessive and depraved secretions, as in dyspepsia, diarrhœa, leucorrhœa, etc.; also in chronic malarial, rheumatic, and scrofulous conditions, with imperfect digestion and assimilation.

Dose.—Tincture, $\frac{N}{4}$, gtt. v. to xxx. = gm. 0.66 to 2.00, or equivalent, discontinuing it, if gastric irritability is induced.

GILLENIA TRIFOLIATA. American Ipecac.

The recent rhizome and rootlets.

Rosaceæ, *Spirææ*.

Gray. Mönch.

Constituents.—A neutral bitter principle, *gillenin*, soluble in alcohol, water, and ether; *tannin*, *resin*, *gum*, *fatty matters*, starch, and albumen.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Useful in dysentery and dyspepsia from relaxation of the gastro-intestinal mucous membranes.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to iij. = gm. 0.06 to 0.18.

In doses of gtt. v. to x. = gm. 0.33 to 0.66 of tincture, $\frac{N}{1}$, or equivalent, the drug proves laxative, and in still larger doses, emetic.

Gillenia stipulacea, Nuttall, has analogous properties, and its rhizome and rootlets may be treated and used as with G. trifol., and in similar doses.

GLECHOMA HEDERACEA. Ground Ivy.

The recent plant.

Labiatae, Nepeteae.

Linné.

Constituents.—No accurate analysis has been made. It contains volatile oil, resin, and the ordinary non-medicinal principles of plants.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Its most important use is in chronic bronchitis with profuse muco-purulent secretion. It is also of value in catarrhal affections of the urinary tract, and in dyspepsia dependent on atony and depraved secretion.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent.

GLYCERINUM, $C_3H_5O_3$. M. wt. 92. Glycerine. Hydrate of Glyceryl. Glyceric Alcohol.

The pure liquid, of specific gravity 1.25, colorless, odorless, neutral to litmus paper, viscid, and of intensely sweet taste.

Solubility.—Freely soluble in alcohol, water, liq. potassæ, aq. ammoniæ; insoluble in ether, chloroform, benzol, and carbon bisulphide. Concentrated sulphuric acid does not attack it, but it decomposes in contact with nitric and hydrochloric acids.

Tests.—*Water*; specific gravity (Sec. 56, Part I.). *Glucose*; mix with equal volume of liquor potassæ, add a few drops of sulphate of copper and boil; a brick-red precipitate indicates glucose. *Sugar*; brown color on mixing equal volumes of the glycerine and pure concentrated sulphuric acid. *Mucilage*; mix one volume of glycerine with five of alcohol, a white turbidity indicates gum, dextrine, or gluc. *Fatty substances*; odor on heating in a watch-glass or rubbing between

the palms of the hand. *Salts*; residue after burning in a platinum capsule or crucible. A carbonaceous residue would indicate sugar or glucose.

Preparations.—Used as a basis for Glycerita (Sec. 22, Part I.), as an addition to some tinctures and a solvent of numerous salts.

Uses.—The therapeutic uses of glycerine depend usually on its tendency to absorb moisture and its unchangeable character. Undiluted, it constricts the surface of abscesses and ulcers, absorbing moisture therefrom, condensing the tissue and lessening the discharge. Somewhat diluted, it serves to soften hardened cerumen, to moisten dry scaly surfaces, and to allay irritation due to lack of moisture. Internally, by mouth or injection, it is valuable in dysentery, hemorrhoids, and to relieve constipation. By atomizer, it serves a good purpose in irritable and dry conditions of the air passages. Mixed with water, it is excellent for dryness of mouth in fevers. It is recommended as a substitute for cod-liver oil, and in diabetes, but with unsatisfactory results.

Dose.—Internally, ʒj. to ʒiij. = gm. 4.00 to 12.00, night and morning. Less amounts for children.

GLYCYRRHIZA GLABRA. Liquorice Root.

The root and underground stem.

Leguminosæ, Papilionaceæ.

Linné. Bentley and Trimen.

Constituents.—*Glycyrrhizate of ammonium*, a combination of the glucoside glycyrrhizin ($C_{24}H_{36}O_9$), with ammonia, and which also exists in the root in a free state, soluble in alcohol, ether, and hot water, and of an intensely sweet taste; *resinous matters, asparagin, albumen, and starch.*

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 40, Part I., using as a solvent a mixture of alcohol, 1 *part*, water, 3 *parts*, stronger ammonia, $\frac{1}{4}$ *part*. A syrup by mixing tincture, $\frac{N}{1}$, 2 *parts*, syrup simplex, 14 *parts*. The commercial extract of the best quality.

A saccharated extract, $\frac{N}{1}$, made from the tincture, $\frac{N}{1}$, as in Sec. 21, Part I.

Uses.—Its preparations are used almost exclusively to correct or cover the bitterness or acidity of other medicines. The bitterness of quinia, aloe, quassia, etc., is almost completely masked by their addition.

For liquid forms, the normal tincture, syrup, or an elixir extemporized by adding a tincture of aromatic oils to the syrup will be found convenient.

For powders, use the saccharated extract, $\frac{N}{I}$, or the powdered extract of commerce. The liquid mixtures must be shaken when administered.

GNAPHALIUM POLYCEPHALUM. Life Everlasting.

The fresh herb in flower.

Compositæ, Senecionidææ.

Michaux. Gray.

Constituents.—*Volatile oil* in small amount, and a *bitter principle*, neither of which have been carefully examined.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Long used as a domestic remedy for coughs and bronchial catarrh. It is also reported as successfully used in flatulent colic, diarrhoeas, cholera morbus, cholera infantum, and in certain neuroses of the sciatic nerve and its larger ramifications. It is worth careful study.

Dose.—Tincture, $\frac{N}{2}$, gtt. j. to xv. = gm. 0.06 to 1.00.

GOODYERA PUBESCENS. Spotted Plantain.

The fresh plant.

Orchidaceæ.

R. Brown. Gray.

Constituents.—These have not been examined.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—These are not well defined, but are worth investigation. It is one of the many reputed "antidotes" to the bite of the rattlesnake, and has been used as an alterative in serofulous affections; internally, for its systemic effects, and locally, to enlarged glands, abscesses, etc.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to 5ss. = gm. 0.33 to 2.00, or equivalent.

GOSSYPIUM HERBACEUM. Cotton Plant.

The recent bark of the root of above or other species.

The hairs (cotton) and oil (Ol. Gossypii) from the seed.

Malvaceæ.

Bentley and Trimen.

Constituents.—The bark contains a *resinous coloring matter*, soluble in alcohol (14 parts), chloroform (15 parts), ether (23 parts), and benzol, a form of *tannin*, *yellow resin*, *fixed oil*, *starch*, *gum*, etc. Cotton (the hairs of the seeds) is almost pure cellulose ($C_6H_{10}O_5$), and yields, with nitric acid, the explosive substance, pyroxylon.

Preparations.—From the bark.

A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

The expressed oil from the seeds.

Uses.—Used for its influence on the female genitalia, external and internal; it stimulates the uterus to contract when labor lingers from torpor, and acts as an emmenagogue when there are dragging sensations in the pelvis, sensation of weight in the bladder, and difficult micturition. The gastric disturbances occurring during the menses or early pregnancy, are often relieved by this remedy in small doses.

The refined oil of the seeds is of a pale-straw color and bland taste, and is often used as a substitute for or adulterant of olive oil. Gossypium (cotton wool) forms an excellent dressing for the treatment of burns, scalds, superficial wounds, and inflammations generally. It allays pain, excludes the atmosphere, and forms an efficient protector of surgical wounds, to prevent purulent infection. Cotton, thoroughly cleaned of oil and foreign substances, is preferable, and is known as absorbent cotton.

Antiseptic cotton, known as “benzoic and salicylic cotton,” is prepared by dipping cotton, 1000 parts, into a solution of either salicylic or benzoic acid, 50 parts, castor oil and resin, each 10 parts, in alcohol 4000 parts, and then drying it.

Dose.—Gossypium herbac., Tincture, $\frac{N}{1}$, gtt. j. to 3j. = gm. 0.06 to 4.00.

GRATIOLA OFFICINALIS. Hedge Hyssop.

The fresh plant gathered before flowering.

Scrophulariaceæ.

Linné.

Constituents.—An amorphous, reddish, and bitter glucoside, *gratiosolin*, soluble in alcohol and water; a white, bitter, crystalline glucoside, *gratiolin*, soluble in alcohol, but slightly in water and ether, and *gratiolic acid*, which is white and crystalline.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This drug is a violent irritant to the gastro-intestinal tract, particularly the rectum. It was formerly used as a drastic hydrogogue like jalap, eleterium, etc., and for similar purposes, but is too violent to be safe. It is worth careful study in irritable conditions of the pelvic viscera. Homœopathic authorities recommend it in mania, gastralgia, enteralgia, nymphomania, and in such neuralgic affections as sciatica, megrim, toothache, etc.

There are several indigenous species of gratiola which probably have

similar properties to the imported, and may be prepared for experiment in the same way.

Dose.—Tincture, $\frac{N}{i}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent to water \bar{z} iv. = gm. 128.00. Teaspoonful dose (gm. 4.00).

GRINDELIA ROBUSTA. Hardy Grindelia.

The recent leaves and flower-heads.

Asteroidææ.

Nuttall.

Constituents.—*Resin* and a small amount of *volatile oil*, both soluble in alcohol. An alkaloid is said to be present, but it has not been fully identified.

Preparations.—A tincture, $\frac{N}{i}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{z}$, with alcohol, as in Sec. 43, Part I.

Uses.—Used principally as a remedy for asthma of the so-called spasmodic variety; also useful in other respiratory neuroses, as in whooping cough, hay asthma, difficult breathing of a spasmodic character, and in chronic catarrhal conditions of the respiratory, cystic, and renal surfaces. Locally, in form of diluted tincture (1 to 16), it is occasionally valuable as an application to chronic ulcers, and as a remedy for rhus poisoning.

Dose.—Tincture, $\frac{N}{i}$, gtt. v. to \bar{z} j. = gm. 0.33 to 4.00, or equivalent.

GRINDELIA SQUARROSA. Scaly Grindelia.

The recent leaves and flower-heads.

Asteroidææ.

Dunal.

Constituents.—These are probably similar in character to those of the *G. robusta*, of which species some believe the *G. squarrosa* to be a variety. A careful chemical examination of both should be made.

Preparations.—A tincture, $\frac{N}{i}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{z}$, with alcohol, as in Sec. 43, Part I.

Uses.—Introduced as a remedy for hypertrophy, especially of the spleen, and also as curative in chronic agues. Pains in the hepatic and splenic regions, puffiness of tissues, pallidity of skin and mucous membranes, soreness of the eyeballs and of the muscles, are given as symptoms indicating the drug. It is recommended also as a local application for rhus poisoning. There exists considerable confusion as to both species of grindelia, not only as to identity, but as to properties. They are often sold mixed together.

Dose.—Tincture, $\frac{N}{i}$, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent.

GUAIAECUM OFFICINALE. Guaiac.

The heart wood (Guaiaci lignum, U. S. P.).

The resin of the wood (Guaiaci resina, U. S. P.).

Zygophyllaceæ.

Linné. Bentley and Trimen.

Constituents.—The important constituent of the wood is the resin (20–25 per cent.). About 90 per cent. of the resin is soluble in alcohol, and the residue is soluble in water. It is composed of guaiacic acid ($C_{12}H_{16}O_6$), crystalline in white needles; guaiaconic acid ($C_{38}H_{40}O_{10}$), light-brown and amorphous; guaiaretic acid ($C_{20}H_{26}O_4$), of faint odor and crystallizing in scales. All these acids are soluble in alcohol and ether, but the first only in water. A resin, *guaiacbeta resin*, and *guaiac yellow*, with *gum* and impurities are also present.

Preparations.—From the wood :

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

From the resin :

A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I. [U. S. P.]

Uses.—Guaiacum is a stimulant to the vascular system, especially influencing that of the skin. It promotes exhalation from and activity of the skin, particularly when it is kept warm. When the surface is cool, the activity of the kidneys is increased. Its alterative and stimulant properties may be utilized in chronic diseases when it is desired to promote the functional activity of the skin, as in chronic muscular rheumatism and skin diseases; also in amenorrhœa and dysmenorrhœa due to atony of the pelvic viscera, and as a local stimulant in tonsillitis.

Dose.—Of the resin, grs. v. to xx. = gm. 0.33 to 1.33, or equivalent.

The tincture, $\frac{N}{1}$, of the wood, may be considered as equivalent to $\frac{N}{5}$ tincture of the resin.

GUARANA. Guarana.

The prepared seeds of *Paullinia sorbilis*. *Martius.*

Sapindaceæ.

Bentley and Trimen.

Constituents.—A crystalline principle, *guaranin* (identical with caffeine), which exists in the drug in combination with a peculiar tannin (*paullinitannic acid*), *saponin*, *volatile oil*, a *greenish fat*, *starch*, and *gum*. Alcohol dissolves the medicinal constituents.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

An extract, with alcohol, as in Sec. 19, Part I.

A saccharated extract, $\frac{N}{I}$, as in Sec. 21, Part I.

Uses.—The only clearly defined use for this remedy is for headaches of nervous origin or the result of excesses or errors of diet, mental depression, etc., and which present as symptoms, feebleness of the pulse, pallidity of the face, pain in the head, usually increased by movement or noise, and accompanied or followed by nausea or vomiting.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to 3j. = gm. 0.33 to 4.00, or equivalent, repeating every half to one hour until the desired result is obtained, stopping its administration should palpitation result.

GUTTA-PERCHA. Gutta-Percha.

The concrete exudation from *Isonandra* (*Dichopsis*. *Bentley*) gutta, in grayish or yellowish thin pieces; specific gravity 0.79, which is increased after removal of contained air by fusion. It becomes flexible between 45° and 60° C. (113° to 140° F.), and plastic at the boiling point of water. It is purified by kneading in hot water.

Sapotaceæ.

Hooker. Bentley and Trimen.

Solubility.—Soluble in chloroform, carbon bisulphide, benzol, oil of turpentine, and boiling ether. It is insoluble in water, alcohol, and fixed oils. Alkalies, hydrochloric, and acetic acids do not affect it; sulphuric and nitric acids decompose it. A similar substance, termed balata, is obtained from the bully tree of the Amazon and Orinoco. Chicle gum is a similar substance from Mexico.

Preparations.—Liquor Gutta-perchæ, $\frac{N}{IO}$, as follows:

Take of Gutta-percha, in thin slices, <i>eight parts</i>	. . . . . 8
Chloroform, <i>sixty parts</i>	. . . . . 60

Shake together until dissolved, and then add

Carbonate of lead, in fine powder, <i>ten parts</i>	. . . . . 10
Previously shaken up with chloroform, <i>twenty-two parts</i>	. . . . . 22

Mix well, let stand for ten days, and decant the clear liquid (U. S. P.).

Uses.—Principally used in solution as a protective to abraded surfaces, to prevent absorption of poisons or the irritation of the atmosphere. (See *Collodium*.) It exerts moderate compression as the solvent dries off, which is modified by the elasticity of the residue. It is a useful substance in many medical and surgical appliances, for which its firmness when cool, and plasticity when warm, peculiarly adapts it. These properties, with its lightness and unalterability, especially recommend it for making bougies, pessaries, syringes, specula, splints, etc.

GYMNOCLADUS CANADENSIS. American Coffee-Tree.

The fresh pulp of the fruit.

Leguminosæ.

Constituents.—These have not been determined.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used as a remedy in sore throat characterized by dark, livid redness; for cough accompanying tonsillitis, erysipelas of the face, hives, typhoid and scarlet fevers.

Dose.—Add tincture, $\frac{N}{2}$, gtt. j. to x. = gm. 0.06 to 0.66, to water \mathfrak{z} iv. = gm. 128.00. Teaspoonful (gm. 4.00) doses.

GYNOCARDIA ODORATA. Chaalmugra.

The seeds.

Bixacææ.

R. Brown. Bentley and Trimen.

Constituents.—An oil, *Ol. Gynocardia*, obtained from the seeds by pressure, or by boiling them with water, is the most important constituent. It is soluble in benzine, chloroform, carbon bisulphide, and partially in ether and alcohol. A peculiar acid, *gynocardic* ($C_{14}H_{24}O_2$), is said to be the most important component of the oil, and to be the source of its burning taste; palmitic, hypogæic, and cocinic acids are also present. This oil is a granular solid, and requires a heat of $42^{\circ}C.$ ($107.6^{\circ}F.$) to melt it; at that temperature its specific gravity is 0.930; it reacts acid, is acrid in taste, and has a faint “scammony-like” odor.

Preparations.—The oil from the seeds.

Ungt. *Gynocardia*, $\frac{N}{4}$, as follows:

Take of <i>Ol. gynocardia</i> , two parts	.	.	.	.	.	.	2
Ungt. <i>paraffini</i> , six parts	.	.	.	.	.	.	6

Mix together in a mortar, or with a spatula upon a pill tile; warming is not required.

Uses.—This remedy, from India, has been highly lauded as curative in leprosy, syphilis, scrofula, phthisis, itch, skin diseases generally, and in rheumatism. It is used locally in ointment to ulcers, eruptions, stiff joints, etc., applied with the finger ends and thoroughly rubbed in.

Dose.—Of powdered seeds, in pill, grs. v. = gm. 0.33.

Of the oil, in capsules or milk, gtt. v. = gm. 0.33.

A milk diet and the avoidance of salt meat and tobacco are advised as auxiliary.

HÆMATOXYLON CAMPECHIANUM. Logwood.

The heartwood.

Leguminosæ, Cæsalpinææ.

Linné. Bentley and Trimen.

Constituents.—*Hæmatoxylin* ($C_{16}H_{14}O_6$) is the most important constituent; it crystallizes in yellowish prisms, is soluble in alcohol and ether, partially in cold water and freely in hot; alkalies dissolve it, forming solutions changing from rose-red to blackish-red. Acids act upon it, producing a yellowish, changing to red solution. The wood also contains *tannin*, *resin*, or *fatty matters*, and a little *volatile oil*.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A decoction, $\frac{N}{15}$, as follows:

Logwood in chips, <i>one part</i>	.	.	.	.	.	.	.	.	1
Water, <i>thirty parts</i>	.	.	.	.	.	.	.	.	30

Boil together until reduced about one-half, and strain, adding water through the strainer to make *fifteen* (15) *parts*.

A dried extract, $\frac{4N}{1}$, by reducing the decoction to dryness by evaporation at the temperature of a water-bath, adding sugar of milk sufficient, as directed in Sec. 20, Part I.

Uses.—Used as a mild astringent in diarrhœa and dysentery of long standing, and especially when affecting children. Locally, it is sometimes employed to promote the healing of ill-conditioned sores.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to 3ss. = gm. 0.06 to 2.00, or equivalent. The extract of commerce has about the strength $\frac{16N}{1}$.

HAMAMELIS VIRGINICA. Witch Hazel.

The fresh bark of branches and root (H. cortex).

The fresh leaves (H. folia). (U. S. P.)

Hamamelaceæ.

Constituents.—These have not been studied with the care the drug deserves. In addition to its *tannin*, the plant contains a peculiar *bitter principle* and a *volatile substance*, neither of which seem to have been examined.

Preparations.—From both bark and leaves.

A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

A distilled spirit, Spiritus Hamameli, as follows:

Take of fresh leaves of *Hamamelis* a *convenient quantity*, pack the leaves in a suitable distilling apparatus, and cover with a mixture of alcohol, *one part* 1
 Water, *five parts* 5

Macerate for twelve hours, and distil at the temperature of a water-bath until there is obtained of the distillate, *four (4) parts*.

Uses.—The usefulness of this remedy is decided in engorgement, inflammation, and hemorrhage of the venous system, especially of the mucous membranes and skin. Hence its value in conditions characterized by fulness of mucous membranes, increase of secretion, either mucous or mucopurulent, enfeeblement of circulation, and turgescence of superficial veins; also in hemorrhages of dark (venous) blood from nose, lungs, stomach, or bowels; hemorrhoids with discharges of blood, and accompanied with burning soreness and rawness of the parts, and for pains in the testes and ovaries when produced by venous congestion.

Dose.—Tincture, $\frac{N}{I}$, gtt. ij. to x. = gm. 0.13 to 0.66, or equivalent, repeated according to the urgency of the symptoms. The tinctures may be used locally, diluted with 5 to 10 volumes of water. The distilled spirit will be found a useful local application, but it represents the volatile principles only, and is not as reliable as the tincture.

HEDEOMA PULEGIOIDES. Pennyroyal.

The fresh leaves and tops.

Labiatae, Satureiæ.

Gray. Bentley and Trimen.

Constituents.—A volatile oil, *Ol. Hedeomæ*, is the important constituent; it is clear, free from color, or with but a slight yellowish tint, pungent odor and taste, soluble freely in alcohol, and of specific gravity .94 to .95.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A tincture of the oil, $\frac{N}{10}$, with alcohol, as in Sec. 46, Part I.

Uses.—Used for its influence on the skin, kidneys, bladder, uterus, and ovaries. In amenorrhœa from cold, suppression of the lochia, congestion of the uterus and ovaries of a passive character, it is a useful remedy; also in flatulent colic, to increase the action of the cutaneous exhalants, and dissipate the congestions tending to diarrhœa or bronchial inflammation.

Dose.—Tincture, $\frac{N}{I}$, gtt. x. to 3ss. = gm. 0.66 to 2.00, or equivalent. Tr. of the oil, gtt. j. to x. = gm. 0.06 to 0.66.

HELENIMUM AUTUMNALE. Sneezeweed.

The fresh flowers and leaves.

Compositæ, Senecionideæ.

Linné. Mehan.

Constituents.—While these have not been carefully determined, the plant is known to contain an amorphous *bitter glucoside*, soluble in ether, alcohol, and boiling water. A small amount of *tannin* is also present with the usual non-active constituents of most herbs.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This plant has not been studied. The leaves and flowers in powder have long been used as an errhine. There is evidence showing that, taken internally, it is a powerful motor irritant, producing twitching of the muscles, spasm, and convulsions. Another species, *H. tenifolium*, possesses these properties in great intensity. This drug should be investigated and its remedial value, if any, determined.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent, carefully noting its effects.

HELIANTHEMUM CANADENSE. Frostwort.

The fresh plant in flower.

Cistaceæ.

Michaux. Gray.

Constituents.—A *bitter principle* and *tannin* seem to be present, but the plant has not been analyzed.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This is a useful remedy in scrofulous swellings and inflammations involving the lymphatic glands of the nasal passages and throat, the eyes and ears and intestinal canal; also, in scrofulous eruptions and ulcerations. It is probably best known as a remedy for chronic diarrhœa and dysentery.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to 3ss. = gm. 0.06 to 2.00, or equivalent, and, locally, diluted, as a wash or gargle.

HELIANTHUS DIVARICATUS. Wild Sunflower.

The fresh leaves (*H. folia*).

The fresh root (*H. radix*).

Compositæ, Senecionideæ.

Linné. Gray.

Constituents.—No analysis of the wild sunflower has been made.

There are many species of it, all perennial plants, and probably all possessing similar virtues. They should be investigated.

Preparations.—From both leaves and root.

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug has not received the attention it deserves. It greatly resembles *Dioscorea vill.*, and is an efficacious remedy in bilious colic. It is also laxative.

The *H. annuus*, while possessing somewhat similar virtues, is not so powerful. A syrup from the seeds is demulcent, and was formerly a very popular domestic remedy for irritative coughs. The oil from the seeds possesses valuable properties, which should find many applications as a substitute for olive or other bland vegetable oils.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to 3ss. = gm. 0.33 to 2.00, or equivalent.

The preparations from the root are rather stronger than those from the leaves.

HELLEBORUS NIGER. Black Hellebore.

The rhizome and rootlets.

Ranunculacææ, Helleboreæ.

Linné. Bentley and Trimen.

Constituents.—*Helleborin* ($C_{36}H_{42}O_6$), a crystalline glucoside, freely soluble in alcohol and chloroform, slightly in water and ether; *helleborein* ($C_{26}H_{40}O_{15}$), a glucoside in colorless, minute needles, soluble freely in water, less so in alcohol, and insoluble in ether; an *organic acid*, probably identical with aconitic acid; *resin, volatile and fatty oils* are the important constituents.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

[Homœopathic tincture has the strength, $\frac{N}{5}$.]

Uses.—In large doses this drug is a violent and unsafe agent, causing violent vomiting, acting as a local irritant, drastic purgative, and inducing faintness, paralysis, and insensibility. In small doses it is a useful remedy in conditions requiring a stimulant to the spinal and sympathetic nervous systems, as in uncomplicated anasarca following scarlatina; as an emmenagogue when the pelvic circulation is languid; to increase virility in the male, and in cases of sterility when dependent on the torpor alluded to. It has also proved a valuable remedy in mania and melancholia, especially the latter. The characteristic conditions in cases benefited are sensory dulness, hebetude, indifference, a state of stupor, screaming and starting in sleep, etc.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent, added to water ℥iv. = gm. 128.00. Teaspoonful doses (gm. 4.00) every two to four hours.

HEMIDESMUS INDICUS. Indian Sarsaparilla.

The root.

Asclepiadaceæ.

Bentley and Trimen.

Constituents.—This root, which has an agreeable odor and a slightly acrid taste, has not been accurately examined. It is known to contain a scaropten, obtained by distillation with water (hemidesmic acid or hemedesmine).

Preparations.—Syrupus Hemidesmi, $\frac{N}{I\bar{O}}$, as follows:

Take of Hemidesmus root, bruised, <i>one part</i>	.	.	.	.	.	1
Boiling water, <i>five parts</i>	.	.	.	.	.	5

Infuse the root in the water in a covered vessel for four hours, permit the impurities to subside, or strain and add to the clear liquid, white sugar sufficient to make *ten (10) parts*. Dissolve by agitation or by gentle heat.

(Syrupus Hemidesmi, Br. P., is equivalent to above.)

Uses.—This remedy increases the activity of the skin and kidneys, and is claimed as useful in syphilitic skin diseases, and for some forms of indigestion. It is probably equivalent in value to sarsaparilla, as a substitute for which it was originally introduced. It is principally employed, on account of its pleasant flavor, as an ingredient in mixtures.

Dose.—Syrup, $\frac{N}{I\bar{O}}$, ℥j. to ℥ij. = gm. 4.00 to 8.00.

HEPATICA TRILOBA. Liverwort.

The fresh plant.

Ranunculaceæ, Anemonideæ.

Chaix. Gray.

Constituents.—No analysis has been made. *Tannin, sugar,* and *mucilage* are present.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Used in chronic irritation of the throat and lungs, and in bronchitis with purulent or bloody expectoration. When there is a tickling, itching, and scraping sensation in the fauces, it will be found a useful remedy.

Dose.—Tincture, $\frac{N}{I}$, ℥j. to ℥ij. = gm. 4.00 to 8.00, to water ℥iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

HERACLEUM LANATUM. Cow Parsnip.

The fresh root.

Umbelliferæ, Orthospermæ.

Linné. Gray.

Constituents.—*Volatile oil, resin,* and an *acrid principle* are present, but the plant has not been carefully investigated.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—The plant has been but little used, but is worthy of study as a spinal stimulant. It directly influences the secreting function of the gastric and intestinal surfaces, and will be found serviceable in colds, colic, intestinal disorders, *suppresio mensium*, and in epilepsy accompanied with flatulency.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

HEUCHERA AMERICANA. Alum Root.

The recent root.

Saxifragaceæ.

Linné. Gray.

Constituents.—Not fully determined. 18 to 20 per cent. of *tannin* is present.

Preparations.—A tincture, $\frac{N}{I}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—Used as an astringent application to ulcers and hemorrhoids; internally to check hemorrhage and as a remedy for diarrhœa and menorrhagia. Very similar to *geranium mac.*

Dose.—Tincture, $\frac{N}{I}$, gtt. x. to 3j. = gm. 0.66 to 4.00, or equivalent.

Locally, diluted with water.

HIERACIUM VENOSUM. Rattlesnake Weed.

The fresh plant.

Compositæ, Cichoraceæ.

Linné. Gray.

Constituents.—Not well known. The plant has no odor, but has an acrid somewhat bitter taste.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug has been but little used and deserves study. It has been employed in scrofulous and chronic catarrhal complaints, and

has the reputation of being an antidote to the bite of venomous snakes.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to 3ss. = gm. 0.06 to 2.00, or equivalent.

HUMULUS LUPULUS. Hops.

The strobiles. Humulus (U. S. P.).

The yellow glandular powder separated from the strobiles. Lupulina (U. S. P.).

Urticaceæ, Cannabinææ.

Linné. Bentley and Trimen.

Constituents.—*Volatile oil* (0.8 per cent.), which consists of a light oil isomeric with turpentine ($C_{10}H_{16}$) and valerol ($C_6H_{10}O$), which gradually oxidizes into valeric acid, which acid is also obtained in preparing the volatile oil; *resin* (9–18 per cent.), a volatile alkaloid, *lupulina*, resembling conia in odor; *tannin* (4 per cent.), *wax* (myricin or myricetic palmitate), especially in the lupulin, which also contains a bitter principle, *lupamaric acid* ($C_{32}H_{50}O_7$). The medicinal virtues of hops reside principally in the lupulin, which forms about 10 per cent. of their weight.

Preparations.—From both the entire hop and from the lupulin.

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

[Tinctura humuli, U. S. P. = $\frac{N}{5}$, from the entire hop.]

Uses.—Used as a tonic in dyspepsia characterized by exhaustion and irritability of the stomach; also in flatulent colic when uncomplicated, and in mild forms of diarrhœa. Irritability of the genito-urinary organs comes under its curative influence, hence its successful use in incontinence of urine, priapism, involuntary seminal emissions, etc. Locally, the strobiles are a popular and useful application (in the form of a poultice or inclosed in a bag and moistened with hot water, alcohol, or vinegar), for their anodyne effects in inflammatory and painful local difficulties, as in colic, bruises, abscesses, toothache, etc., etc.

Dose.—Tincture, $\frac{N}{1}$, of humulus, gtt. j. to 5j. = gm. 0.06 to 4.00 or equivalent.

The corresponding tinctures of lupulin may be given in doses of $\frac{1}{10}$ to $\frac{1}{5}$ as great.

HYDRANGÆA ARBORESCENS. Wild Hydrangea.

The fresh root.

Saxifragaceæ, Hydrangieæ.

Linné. Gray.

Constituents.—With the exception of *resin*, *gum*, and *starch*, the constituents have not been determined.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This drug is used to correct the derangement in function of the kidneys, which tends to the formation of calculi and urinary deposits. It alleviates the cystic and urethral irritation, and so changes the character and quantity of urine as to prove serviceable in cases of gravel.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

HYDRARGYRI CHLORIDUM CORROSIVUM, $HgCl_2$. M. wt. 270.

Mercuric Chloride. Corrosive Chloride of Mercury.

Translucent, colorless, crystalline masses or small prismatic crystals, of specific gravity 5.43, and wholly volatile at $295^{\circ}C.$ ($563^{\circ}F.$); it is acrid in taste, and acid to litmus paper.

Solubility.—Soluble in water (in 16 parts at $0^{\circ}C.$, $32^{\circ}F.$, and $2\frac{1}{2}$ parts at $100^{\circ}C.$, $212^{\circ}F.$); glycerine (7 parts in 100); alcohol ($2\frac{1}{3}$ parts of cold and $1\frac{1}{6}$ parts boiling), and ether (3 parts); also without decomposition in sulphuric, nitric, and hydrochloric acid, from which it crystallizes on cooling.

Tests.—*Fixed impurities*; residue when heated. *Calomel*; incomplete solubility in alcohol. *Arsenic*; black discoloration of a piece of paper which has been moistened with a drop of solution of silver nitrate, and placed over the mouth of a test-tube in which is heated the solution of the suspected salt, liquor potassæ in excess, and some fragments of zinc.

Uses.—See remarks under *Hydrargyrum*.

Yellow wash, *Lotio hydrargyri flava* of the British Pharmacopœia, is made by mixing 18 grains of mercuric chloride with 10 fluidounces of lime water. It is a mixture of calcium chloride and precipitated mercuric oxide.

HYDRARGYRI CHLORIDUM MITE, Hg_2Cl_2 . M. wt. 471.

Mercurous Chloride. Calomel.

The salt, prepared by sublimation and condensation by air or steam. A heavy, white powder of specific gravity 7.00, volatile when heated. It is converted into the corrosive chloride slowly, by boiling with water; by heating with diluted hydrochloric acid; by contact with solution of chloride of ammonium (rapidly when hot and concentrated), chloride

of sodium, or potassium; by trituration with impure sugar, and by contact with chlorine. The change takes place more rapidly when solutions are concentrated and temperature elevated. Boiling mineral acids produce mercuric chloride rapidly, with the formation also of salts of their radicals (Mercuric sulphates, nitrates, etc.).

Solubility.—Alcohol, water, and ether do not dissolve calomel when agitated with it. It dissolves to a small extent in animal fluids, such as albumen, and pancreatic and salivary secretions.

Tests.—*Fixed impurities*; residue on heating. *Ammonium compounds*; odor when heated with liquor potassæ. *Mercuric chloride*; white precipitate with silver nitrate when added to water which has been agitated with the suspected calomel, and filtered. *Ammoniated mercury*; treat the calomel remaining on the filter in the previous reaction with diluted acetic acid, and add solution of silver nitrate; a white precipitate indicates ammonio-mercuric chloride.

Uses.—See *Hydrargyrum*.

“Black wash,” Lotio hydrargyri nigra of the British Pharmacopœia, is made by mixing 30 grains of calomel with 10 fluidounces of lime-water. It is a mixture of calcium chloride and mercurous oxide.

HYDRARGYRI CYANIDUM, $\text{Hg}(\text{CN})_2$. M. wt. 252.

Mercuric Cyanide. Cyanide of Mercury.

Colorless prisms of bitter metallic taste, intensely poisonous, darkened by exposure, and decomposed by hydrochloric acid into mercuric chloride and hydrocyanic acid. Nitric and dilute sulphuric acid do not decompose its solution.

Solubility.—Freely soluble in water and alcohol; sparingly soluble in absolute alcohol.

Tests.—*Other soluble mercuric salts*; transient turbidity on adding solution of potassium iodide to the suspected solution. *Mercuric oxycyanide*; brown color to turmeric paper, and imperfect solubility in cold water.

Uses.—See *Hydrargyrum*.

HYDRARGYRI IODIDUM RUBRUM, HgI_2 . M. wt. 454.

Mercuric Iodide. Red Iodide of Mercury.

A scarlet or vermilion-colored crystalline powder, fusing at 240°C . (464°F .), and subliming in yellow crystalline scales, which turn red again on cooling, and recrystallize in octahedra or prisms.

Solubility.—Freely soluble in hot alcohol; slightly in ether and hot or cold water. It also dissolves in solutions of potassium iodide, cyanide, and hydrate, sodium hydrate, chloride, and hyposulphite, and in solution of mercuric chloride.

Tests.—*Non-volatile impurities*; residue on subliming the salt, or on treating it with boiling alcohol or solution of potassium iodide, either of which should completely dissolve it.

Uses.—See *Hydrargyrum*.

It is a constituent of Liq. arsenii et hydrargyri iodidi, U. S. P. (Donovan's solution), in which it is present in the proportion of one per cent.

HYDRARGYRI IODIDUM VIRIDE, Hg_2I_2 . M. wt. 654.

Mercurous Iodide. Green Iodide of Mercury.

A greenish-yellow powder, which volatilizes completely on heating, decomposing into mercury and mercurous-mercuric iodide (Hg_2I_2 . 2HgI_2). It decomposes in contact with strong acid and alkalies, or boiling solutions of iodides, chlorides, and bromides. Mercuric iodide and mercury result from contact with the three last mentioned salts.

Solubility.—Slightly soluble in water; insoluble in alcohol and ether.

Tests.—*Fixed impurities*; residue on strongly heating. *Mercuric iodide*; residue of red oxide on evaporating a small quantity of alcohol which has been rubbed with a few grains of the salt and filtered.

Uses.—See *Hydrargyrum*.

HYDRARGYRI OXIDUM FLAVUM, HgO . M. wt. 216.

Yellow Mercuric Oxide.

An orange-yellow powder, which becomes red when heated, and is without crystalline structure. Although it has the same chemical composition as the red oxide, the fine state of division of its particles makes it more readily attacked by reagents. It readily combines with oxalic acid, and turns black when heated with solution of mercuric chloride in alcohol; these reactions distinguish it from red oxide.

Tests.—*Impurities*; insoluble residue on heating with dilute nitric acid, or non-volatile matter remaining when strongly heated in a dry test-tube.

Uses.—See *Hydrargyrum*.

Ungt. hydrargyri oxidi flavi (1 part of oxide to 9 of simple ointment) is official in the U. S. P.

HYDRARGYRI OXIDUM RUBRUM, HgO. M. wt. 216.**Mercuric Oxide. Red Oxide of Mercury.**

An orange-red powder, sp. gr. 11.30, decomposing when heated above 300°C . (572°F .), and entirely volatile below red heat.

Solubility.—Slightly soluble in water; insoluble in alcohol, ether, glycerine, and chloroform. Strong acids dissolve it; and it is soluble to a small extent in animal secretions.

Tests.—*Red oxide of lead, brick-dust, or vermilion*; residue on treating with nitric acid; volatile if vermilion, brown if oxide of lead, non-volatile if brick-dust. *Mercuric nitrate*; red fumes when heated. *Fixed impurities*; residue on strongly heating.

Uses.—See *Hydrargyrum*.

Ungt. hydrarg. oxidi rubri, U. S. P., contains red oxide, 1 part, simple ointment, 9 parts.

HYDRARGYRI SUB-SULPHAS FLAVA, $2\text{HgO}.\text{HgSO}_4$. M. wt. 728.**Oxy-mercuric Sulphate. Yellow Sulphate of Mercury.**

A lemon-yellow powder volatilizing and decomposing when strongly heated, vapors of mercury and sulphurous acid-gas being emitted.

Solubility.—Slightly soluble in cold, sparingly in hot water, freely in diluted nitric or hydrochloric acids.

Tests.—*Fixed impurities*; incomplete volatility.

Uses.—See *Hydrargyrum*. Has been recommended as an emetic in croup, but is an unsafe agent.

HYDRARGYRI SULPHAS, HgSO_4 . M. wt. 296.**Mercuric Sulphate. Sulphate of Mercury.**

A white, crystalline powder, decomposed, and entirely volatile when heated strongly; contact with water also decomposes it into oxy-mercuric sulphate and acid sulphate.

Tests.—*Impurities*; residue on strongly heating.

Uses.—Used only for preparation of oxy-mercuric sulphate or turpeth mineral, which see.

HYDRARGYRI SULPHIDUM RUBRUM, HgS . M. wt. 232.**Mercuric Sulphide. Red Sulphuret of Mercury.**

A bright scarlet powder, which darkens in color on heating in contact with air, and finally is entirely volatilized and decomposed. It

sublimes without change below red heat in close vessels; specific gravity 8.1.

Solubility.—Insoluble in water, alcohol, and ether, strong acids and alkaline hydrates. Nitro-hydrochloric acid dissolves it to a colorless solution.

Tests.—*Red lead, lead chromate or iron*; residue on strongly heating, which dissolves in nitric acid and gives reactions for lead or iron. *Arsenic or antimony sulphides*; yellow or orange precipitate on acidulating a clear solution obtained by warming liquor potassæ with the suspected salt, and filtering.

Uses.—See *Hydrargyrum*. Used principally for mercurial fumigation when the local influence of metallic mercury is wanted. The sulphurous acid given off makes the fumes excessively irritating. The method is a dangerous one.

HYDRARGYRUM, Hg. At. wt. 200. Mercury.

A heavy liquid of silvery whiteness, specific gravity 13.57 at 15° C. (59° F.). It is volatile to a perceptible degree, even at ordinary temperatures, boils at 350° C. (662° F.), and solidifies to a crystalline, ductile mass at -39.44° C. (-39° F.). When pure its brilliancy is permanent at ordinary temperature.

Solubility.—Freely soluble in nitric acid, and aided by heat in sulphuric acid. It is insoluble in strong hydrochloric acid, and in the common neutral solvents.

Tests.—*Other metals*; agitate a little mercury with a mixture of equal parts of liq. ferri perchloridi and water, decant, dilute one-half, and add a few drops of solution of potassium ferridcyanide—a blue turbidity indicates the reduction of some ferric to ferrous chloride, by a metal amalgamated with the mercury.

Preparations.—Mercury is used in the proportion given in the following preparations, which are official in the U. S. P.:

Emplastrum ammoniaci cum hydrargyro	18.00 per cent.
Emplastrum hydrargyri	30.00 “
Hydrargyrum cum creta	38.00 “
Massa hydrargyri	33.00 “
Unguentum hydrargyri	45.00 “

Note.—Mercury forms two series of salts in combining with other radicals. In one series its atom is univalent, and the salts formed are termed *mercurous*; in the other, its atom is bivalent, and the compounds are termed *mercuric* salts. Representatives of both series

have been described. The mercuric salts, as a rule, dissolve more readily in ordinary solvents than mercurous, their solutions have acid reaction and are more poisonous. Mercurous salts give white precipitates with hydrochloric acid, and black precipitates with alkaline carbonates when boiled, and with potassic, sodic, calcic, or ammoniac hydrates at ordinary temperatures. Mercuric salts give yellow precipitates with sodic or potassic hydrates, and a scarlet one with potassium iodide. This last redissolves when either the mercuric solution or the reagent is in excess.

Uses.—"Probably all mercury compounds ultimately assume the same form in the blood" (Ringer). For this reason the physiological and therapeutic influence of both the element and its salts may, without impropriety, be considered identical in kind, differing only in the intensity of their action. Mercury has been employed, internally, since the time of the renowned empiric Paracelsus, and it may with truth be stated that the drug has been more used and abused than any single substance administered for the cure of disease. Its poisonous action has been closely studied. The following descriptive summary is from a recent authority: "Among the earlier symptoms of the action of mercury are an increase of the salivary secretion, an alteration of its quality, fetor of the breath, swollen tongue, soreness of the teeth, sponginess of the gums, swelling of the parotid, sublingual, and submaxillary glands, aching of the jaws and teeth, with general muscular soreness and aching of the limbs, and some elevation of the temperature. To this state are applied the terms *acute mercurialismus*, *ptyalism*, or, in common language, *salivation*."

"Any considerable quantity of mercury administered a sufficient time, will affect the quality and composition of the blood; the red globules are diminished in number; the fibrin loses its plasticity; the proportion of water is increased, and various effete materials, whose nature is unknown, accumulate. Mercury is deposited in all the textures, interferes with the normal nutritive processes, and is found in all the secretions and excretions. A marked degree of anæmia, loss of flesh, muscular weakness, intractable ulcerations of the skin, loss of hair, eczema, a foul breath, diarrhoea, the stools being very fetid, are the characteristic symptoms of the action of mercury on the solids and fluids of the body" (Bartholow).

"The cholagogue action ascribed to mercury, and especially to calomel, was an invention of the British physicians in India, who long accepted the doctrine that large doses of calomel diminish the vascularity of the gastro-intestinal mucous membrane, and dissolve the inspissated

sated mucus investing it and obstructing the gall ducts, and that small doses of the medicine are absorbed, and through the blood promote the secretion of bile. But a careful repetition of their experiments proved that large doses of calomel, as well as small doses, lessen the biliary secretion, and that among purgative medicines mercury in every form is the *very one that tends least* to augment the discharge of bile."

"It has long been believed that a proof of the cholagogue action of calomel is to be found in the darker color of the stools during its administration, which have been called 'calomel stools,' and although one or two experimenters have recently reached the same conclusion, yet the more probable opinion is that the color in question is due to the presence of subsulphide of mercury in the dejections, and that even the natural brown color of the feces is produced, not by the bile, which is all reabsorbed in the small intestine, but by a special excretion of the colon. On the whole, the most probable conclusion upon this subject is expressed in these words: 'Calomel is not a cholagogue, but diminishes the secretion of bile.'" (National Dispensatory. Stille and Maisch.)

The same authority says, in reference to the use of calomel in typhoid and other fevers: "It has been recommended to administer calomel in small and repeated doses, so as slightly to affect the gums, about the height of the disease, when the tongue grows dry, the abdomen tympanitic, and the mind dull; but if we know anything about the nature of these symptoms, it is that they are signs of increased exhaustion of the system and poisoning of the blood, and, therefore, the very last to be treated by a medicine which tends directly to aggravate these conditions." "At one time calomel was held to be specific in yellow fever; according to some if prescribed in large doses, according to others, if given in small doses, intended to produce its constitutional effects. Experience has condemned both methods as not only useless but injurious." "The same may be said, but not so absolutely, in regard to remittent fever. The constitutional action of calomel in this disease is no longer sought by judicious physicians." "Of acute inflammations for whose treatment calomel has long been supposed essential, may be mentioned pericarditis, pleurisy, pneumonia, peritonitis, meningitis, and hepatitis. It is now apparently determined that none of these diseases, as a rule, require calomel for their cure, and that most of them are aggravated by it."

"Calomel is worse than useless in acute articular rheumatism; it neither mitigates the disease nor prevents the complications." "In diseases of the kidney, whether acute or chronic, mercury is a mischievous medicine."

These statements indicate a marked change in opinion among the

thinking men of the school of practice represented by their eminent authors quoted. The remedy, which during the last century, and until within a few years, was administered with full faith in its efficacy in the diseases mentioned, is evidently falling into discredit, or better and safer measures being substituted for it. It is but just to say, however, that the faith in the specific antidotal virtues of mercury to the poison of syphilis remains firm with the majority of that school, although the method of using it has undergone a marked change. The National Dispensary says: "It is probable that as much injury has been inflicted by the use of mercury in primary syphilis as good has been accomplished by its administration in the constitutional form of the disease; and when it is considered that every simple sore following a suspected coition was apt to be treated as syphilitic, by mercurialization of the system, it may be a question whether, on the whole, the medicine has not been more mischievous than useful." The method most in vogue by those who believe mercury necessary to the cure of this disease is the use of small doses, "gradually increased until its effects on the disease begin to appear, or some soreness of the gums occurs; it should then be continued in a diminished quantity, or even temporarily suspended if the symptoms begin to decline; but it should never be abandoned, as long as any trace of the disease remains" (Nat. Disp.). J. Hutchinson, in Reynold's System, says: "It appears to me that the balance of evidence is in favor of the belief that mercury is a most potent remedy against syphilitic inflammations, but that it does not act as an antidote to the virus. I fear we have but little proof that mercury tends, on the whole, to abridge the duration or mitigate the severity of the syphilitic fever and its sequelæ."

The action of mercury is well summed up in the following, from the National Dispensary: "Being essentially non-nutritive, yet penetrating every tissue, it probably acts in small and transient doses as a stimulant of all organic processes; but in a little greater proportion and by continued use it impairs nutrition, hindering the formation of tissue on the one hand, and on the other, hastening its destruction and elimination. At the same time it augments more or less the glandular secretions. It diminishes the proportion of fibrin and of the red corpuscles of the blood. Thus, hindering nutrition at every step, mercury causes the waste of all the tissues, and especially of those least organized, as cicatrices and callus, and favors the removal of all plastic exudations. These effects are essentially morbid and destructive, and only incidentally, and within varying limits can become salutary."

A belief in this "essentially morbid and destructive" effect on this drug has caused a large body of American physicians to oppose its use

under any circumstances; others, more conservative, admit its usefulness, "incidentally," in minute and "transient" doses as a stimulant to organic processes, and that if useful at all in syphilis it should be to promote the absorption and removal of exudations and inflammatory products, and that it in no sense antidotes the virus. They believe it should be classed with many other drugs, both mineral and organic, which, in minute doses, carefully watched, may prove useful in judicious hands, but which, when used in such a manner as to impair the normal vitality of the patient, are eminently destructive and harmful.

HYDRARGYRUM AMMONIATUM, NH_2HgCl . M. wt. 251.5.

Mercuric Ammonium Chloride. Ammoniated Mercury.

A white mass or powder, which is volatile without fusion and without residue. Treated with solution of potassium or calcium hydrate, ammonia gas is evolved, and the powder is colored yellow. Boiling water dissolves ammonium chloride, and a yellow basic compound remains.

Solubility.—Soluble in nitric, acetic, and hydrochloric acids; insoluble in alcohol, ether and water.

Tests.—*Fixed salts, zinc, calcium, etc.*; treat a solution of the salt in acetic acid with excess of sulphuretted hydrogen, filter and evaporate to dryness; a residue indicates impurities. *Starch*; charring of residue from last test when ignited. *Lead*; white precipitate with sulphuric acid added to solution of salt in acetic acid. *Carbonates*; effervescence on treating with acid. *Mercuric-diammonium chloride* $(\text{NH}_3)_2\text{HgCl}_2$, or fusible white precipitate is distinguished from the salt under consideration by its fusibility below red heat, and its yielding a transparent and an opaque white sublimate at a higher temperature.

Uses.—See *Hydrargyrum*. Not used internally. Locally in ointment in ophthalmia and skin diseases.

[Ungt. Hydrargyri Ammoniati, U. S. P., contains ammoniated mercury, *one part*, benzoinated lard, *nine parts*.]

HYDRASTIS CANADENSIS. Golden Seal.

The rhizome and rootlets.

Ranunculaceæ, Helleboreæ.

Linné. Bentley and Trimen.

Constituents.—The medicinal value of hydrastis depends upon its alkaloid principles, three in number. *Berberina* is of a yellow color, and its salts, sulphate, muriate, and phosphate, are found in commerce as compounds of hydrastia. It is soluble in alcohol and water. True *hy-*

drastia ($C_{22}NH_{23}O_6$) is, when separated and purified, a white alkaloid, crystallizing in prisms which are soluble in boiling alcohol, in ether, chloroform, and benzol; insoluble in water. A third alkaloid, which is dark yellow, and forms a compound with sulphuric acid, which is colorless, is called *xanthopuccina*, soluble in alcohol and hot water, insoluble in ether and chloroform. Two *resins*, soluble in alcohol, one fatty and acrid, the other brown and bitter, are also present.

Preparations.—*Muriate* of Berberina (*Hydrastia mur.* of commerce), in lemon-yellow needles or powder, soluble in 500 parts of water, insoluble in ether and chloroform, and slightly soluble in alcohol.

Sulphate of Berberina (*Hydrastia sulph.* of commerce), freely soluble in hot or cold water, slightly soluble in alcohol, insoluble in ether and chloroform. Orange yellow tufts in needle-shaped crystals.

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A glycerite, $\frac{N}{1}$, for use when alcohol is objectionable, as follows :

Take of Tincture, $\frac{N}{1}$, three parts	3
Glycerine, one part	1
Water, one part	1

Mix and recover the alcohol by distillation, or evaporate it at the temperature of a water-bath, then add

Water sufficient to make three parts	3
--	---

Filter until clear.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

[*Tinctura Hydrastis*, U. S. P. = $\frac{N}{2}$.]

Uses.—This drug will be found especially valuable in diseases characterized by a sub-acute or chronic catarrhal condition of mucous membranes which are relaxed, and the secretion profuse, thick, yellow or greenish-yellow, and tenacious. Under its influence tonicity replaces the relaxation, and the abnormal secretion changes to a healthy character, both in quality and quantity. This catarrhal condition may affect the gastric, intestinal, cystic, vaginal, urethral, uterine, or bronchial surfaces, or may be present in the nasal passages, in those of the ear, or involve the conjunctiva. In all these cases, when no fever is present, the remedy will be found a useful one. Relaxed and atonic conditions of the mucous surfaces of the mouth and throat, with secretion of yellow, tenacious mucus, ulceration or erosion of the same or other mucous surfaces, come under its curative influence. Excoriations and ulceration of the skin are benefited by its local use. The remedy may be used internally, as a gargle, as a wash, or injection, or by spray apparatus. For local use, the sulphate of berberina or the gly-

cerite of hydrastis are to be preferred. Either preparation mentioned above is suitable for internal use. When possible it should be used both locally and internally in catarrhal disorders.

Dose.—Tincture, $\frac{N}{i}$, gtt. x. to $\bar{5}j$. = gm. 0.66 to 4.00, or equivalent to water $\bar{3}iv$. = gm. 128.00. Teaspoonful doses (gm. 4.00).

Muriate or sulphate of berberina (hydrastia) grs. $\frac{1}{8}$ to j . = gm. 0.008 to 0.06, internally, or gr. j . = gm. 0.06 to water $\bar{3}j$. = gm. 32.00 for local use as a spray or gargle.

Glycerite, $\frac{N}{i}$, $\bar{5}j$. to $\bar{5}j$. = gm. 4.00 to 32.00 to water Oj . = gm. 512.00 as a wash or injection; also internally same as tincture, $\frac{N}{i}$.

HYDROCOTYLE ASIATICA. Hydrocotyle.

The entire plant.

Umbelliferæ.

Linné. Bentley and Trimen.

Constituents.—*Vellarin*, said to be the active principle, and an *oily substance* are given as present, but the plant has not been carefully examined.

Preparations.—A tincture, $\frac{N}{i}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Though brought to notice several years since, and still recognized in homœopathic pharmacy, this drug is but little used. Originally, it was introduced as a remedy for leprosy, and subsequent investigation seemed to have confirmed its efficacy. Several species of American growth are known, and it is suggested that the *H. Americana* (Gray), which is the most common, be tried as a substitute for the Asiatic plant, and to determine its influence on the skin and glandular system.

Dose.—Tincture, $\frac{N}{i}$, gtt. j . to x. = gm. 0.06 to 0.66, or equivalent.

HYDROGENII PEROXIDUM, H_2O_2 . M. wt. 34. Hydrogen Dioxide.

A colorless and odorless liquid of oily appearance, harsh, bitter taste, and specific gravity 1.452. It decomposes with violence when heated or placed in contact with gold, silver, platinum, or carbon, oxygen being given off. The oxides of the three metals are reduced to the metallic state in its presence, yet it usually acts as an oxidizer, transforming many lower oxides into higher, discharging the color of litmus and turmeric, and bleaching vegetable and animal tissue. It acts as a caustic on the skin, coloring it white, and causing much itching.

Solubility.—Soluble freely in cold water, and in alcohol and ether to a less extent.

Tests.—Its presence may be proven by the blue color (of perchromic acid) imparted to a little ether, which has been agitated with the peroxide acidulated with sulphuric acid, and mixed with a few drops of solution of potassium chromate.

Uses.—Introduced on theoretical grounds, as a remedy in diseases manifesting deficient oxidation, in which it was thought the peroxide would be beneficial by yielding oxygen when brought in contact with the organic constituents of the blood. It was supposed it would thus antagonize septic poisons, act as a stimulant, and convert harmful substances in the fluids into forms suitable for excretion. With such views it has been employed in diabetes, low fevers, chronic rheumatism, cancer, serofulous tumors, and abscesses, and in some forms of atonic dyspepsia; also topically to ulcers, serofulous, syphilitic, or non-specific, as a stimulant and disinfectant. The testimony as to its value is conflicting.

Dose.—Of a solution diluted with water (1 in 20), a teaspoonful to a tablespoonful.

HYOSCIAMUS NIGER. Henbane.

The fresh herb when flowering. [The leaves only, U. S. P.]

Solanaceæ.

Linné. Bentley and Trimen.

Constituents.—An alkaloid, *hyosciamia* ($C_{15}H_{23}NO_3$), which is in wart-like crystals, sometimes in silky, odorless needles, almost insoluble in cold water, freely in hot water, alcohol, ether, chloroform, benzole, and dilute acids, with the latter forming crystallizable salts. It is destroyed by caustic soda and potassa. The plant also contains a glucoside, *hyoscypicrin* ($C_{27}H_{52}O_{14}$), bitter, soluble in water and alcohol, and of neutral reaction. The seeds contain a bland, colorless oil, in amount about 25 per cent. of their weight. It is partly soluble in absolute alcohol.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

An extract, $\frac{6N}{1}$, from the recently dried leaves, with alcohol, as in Sec. 19, Part I.

A dried extract, $\frac{4N}{1}$, from the recently dried leaves, with alcohol, as in Sec. 20, Part I.

[Abstractum Hyoseiami, U. S. P. = $\frac{N}{2}$. Tinctura Hyoseiami, U. S. P. = $\frac{15N}{100}$.]

Uses.—In small doses this remedy acts as a stimulant to the sympathetic system of nerves, reducing capillary circulation by contracting the arterioles, increasing arterial tension and the frequency of the pulse, and accelerating the respiration and intestinal movements. Large doses

exhaust the irritability of the vaso-motor system, and paralyze the nerves presiding over the voluntary muscular movements. The small or stimulant dose is beneficial in sleeplessness from simple cerebral hyperæmia or excitement, or when sleep is dreamful from the same cause; also in weakness or paralysis of sphincter muscles, involuntary convulsion or spasmodic movements of hysterical origin, mercurial and senile tremor, spasmodic, dry coughs, worse at night and when reclining. Large doses are often given for their hypnotic influence, but are unreliable.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

HYPERICUM PERFORATUM. St. John's Wort.

The fresh plant in flower.

Hypericaceæ.

Linné. Gray.

Constituents.—*Hypericum red*, which is said to be a mixture of a red and yellow coloring matter, and is soluble in volatile oils, warm olive or cotton-seed oil, alcohol, and ether, is the most prominent constituent. *Tannin, volatile oil, resin, and pectin* are present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A liniment for local use (Linimentum Hyperici, $\frac{N}{5}$), as follows :

Take of Tincture, $\frac{N}{1}$, one part	1
Refined cotton-seed oil, four parts	4

Mix and digest in a water-bath until the alcohol and water present are expelled, and a uniformly clear reddish solution results; then add oil to make the product weigh *five (5) parts*.

An ointment may be made in a similar manner, substituting Ungt. Paraffini for the oil in the formula.

Uses.—Used internally and locally for mechanical injuries, contusions, lacerations of the tissues, etc., when the intense pain indicates injury to the spinal cord or the nerves of a part. It has also been employed in catarrhal conditions of the surfaces of the lungs, bowels, and especially of the urinary passages; in the latter cases its action resembles turpentine.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent. Locally, in liniment, ointment, or diluted tincture.

HYSSOPUS OFFICINALIS. Hyssop.

The fresh herb in flower.

Labiatae, Satureiæ.

Linné. Gray.

Constituents.—The only one of importance is the *oil of hyssop*, which is greenish-yellow, sp. gr. 0.94, and is freely soluble in alcohol. A *bitter* and an *astringent* principle are present.

Preparations.—Tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

Tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used chiefly as a domestic remedy in coughs, colds, and bronchial catarrh. Atonic and flatulent dyspepsia are benefited by it; and it is also employed as a local stimulant in rheumatism and to bruises.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to 3ss. = gm. 0.33 to 2.00, or equivalent.

IBERIS AMARA. Bitter Candytuft.

The recently gathered ripe seed.

Cruciferæ, Siliculosæ.

Linné.

Constituents.—These have not been fully examined. A sulphuretted *volatile oil*, identical with volatile oil of mustard, is present; also, a *bitter principle*, which has not been studied.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Properly administered, this drug controls vascular excitement through a direct influence on the heart. It is especially recommended to control the excessive action due to hypertrophy with thickening of the heart's walls. It is claimed that the velocity of the heart's beat is not lessened, but the pulse is softened by the remedy. In dropsical, rheumatic, and gouty affections it has some reputation, which, from its influence on the vascular system, is probably well founded. The drug deserves careful study. Excessive doses cause nausea, giddiness, and diarrhœa.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to iij. = gm. 0.06 to 0.20, or equivalent.

ICHTHYOCOLLA. Isinglass.

The prepared swimming-bladder of several species of sturgeon (*Acipenser*. Linné), known in commerce as Russian isinglass. It is insipid to taste, inodorous, semi-transparent, and of whitish color.

Solubility.—Freely soluble in water or dilute alcohol by digestion and subsequent warming. With 24 parts of water it forms a jelly on cooling. If of good quality, the insoluble portion, after treatment with warm water, should not exceed two per cent. When of this purity, isinglass consists of a small amount of membranous matter and salts, associated with gluten, a variety of gelatin.

Uses.—Used as the adhesive material in isinglass and court-plasters, and internally in form of jelly, with or without milk or farinaceous foods, as a nutritive aliment.

IGNATIA AMARA. Ignatia Bean.

The seed (of *Strychnos Ignatii*. *Lindley*).

Loganiaceæ.

Linné. Bergius.

Constituents.—Ignatia contains the alkaloids *brucia* ($C_{23}H_{26}N_2O_4$), 1.43 per cent., and *strychnia* ($C_{21}H_{22}N_2O_2$), 0.52 per cent.; both of these are also found in *nux vomica*, though in different proportions. (See *Nux Vomica*.)

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A trituration of the powdered seeds, as in Sec. 49, Part I.

A dried extract, $\frac{4N}{I}$, with alcohol, as in Sec. 20, Part I.

[Tinctura Ignatiæ, U. S. P. = $\frac{N}{10}$.]

Uses.—Used for its direct influence on the cerebro-spinal axis, whose irritability is diminished by small and increased by large doses of the drug. It is a remedy in many derangements of the digestive and nervous system, especially those arising from emotional disturbances, as fright or grief. Hence it is found useful in sleeplessness, epileptiform and convulsive diseases of women and children; hysteria with mental excitement or depression, acute pain in the head and pressure in the medulla, globus hystericus, hiccough, flatulent distention, and general hyperæsthesia of all the tissues; also indigestion with weak feeling at the epigastrium, flatulence with great nervous depression, and in convulsions of children from intestinal irritation, in the absence of cerebral irritation. The remedy strongly resembles *nux vomica*, but for some unexplained reason seems more especially to influence the medulla and upper part of the cord. The mental depression is prominent in cases most benefited by this drug. In all the above conditions the small dose is required.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to x. = gm. 0.06 to 0.66 to water \mathfrak{z} iv. = gm. 128.00. Teaspoonful dose (gm. 4.00).

ILEX AQUIFOLIUM. Holly.

The fresh leaves.

Aquifoliaceæ.

Constituents.—*Ilicin*, a bitter principle, which is variously described as amorphous, and more or less colored or in crystals, which are needle-shaped. *Ilixanthin* ($C_{17}H_{20}O_{11}$), in yellow needles, soluble in

alcohol and hot water, and which is the yellow coloring matter of the leaves, and *ilicic acid*, which is present as a syrupy liquid.

I. opaca, or American holly, contains ilicin, and is said to have the same properties as *I. aquifolium*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Large doses cause gastric oppression and nausea, colic and diarrhœa. The drug has been used to produce diaphoresis in pleurisy, gout, small-pox, and catarrh, but is now little used. The leaves are the source of the viscid substance known as bird-lime. The influence of small doses on the gastro-intestinal tract and skin should be determined.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

ILLICIUM ANISATUM. Star-Anise.

The fruit.

Magnoliaceæ.

Loureiro. Bentley and Trimen.

Constituents.—*Volatile oil* (5.3 per cent.), *fat*, *resin*, *tannin*, *mucilage*, *pectin*, and a substance called *anethol* ($C_{10}H_{12}O$), or anise camphor, chemically identical with that found in oil of common anise (*Pimpinella anisum*), are present.

Uses.—The uses of this drug are similar to anisum and its oil, for which it may be substituted. (See *Anisum*.)

IMPERATORIA OSTRUTHIUM. Masterwort.

The fresh root-stock.

Umbelliferæ.

Linné.

Constituents.—*Imperatorin* ($C_{12}H_{12}O_3$), which is soluble in alcohol, and when pure forms crystals, which are without color, and in alcoholic solution have a pungent taste, forms, with a *volatile oil*, the constituents of medical interest.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug strongly resembles angelica in odor and taste. It is a European plant, and should not be confounded with the *Heracleum lanatum*, sometimes called masterwort in this country.

It is principally employed as a stimulant in atonic states of the gastro-intestinal tract to relieve colic and dyspepsia, or in states of debility following or accompanying fevers, inflammation, etc.; also, in hysteria and asthma.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

INULA HELENIUM. Elecampane.

The recent root.

Compositæ, Asteroidæ.

Linné. Bentley and Trimen.

Constituents.—*Volatile oil*; an *acrid resin*; a peculiar *bitter principle*; a camphor, *inulol*, isomeric with laurel camphor, and the anhydrid of *inulic acid*; *helenin* (C_6H_8O), which is crystalline and insipid; *inulin* ($C_{12}H_{20}O_{10}$), a substance resembling starch, but coloring iodine yellow instead of blue; *gum, lignin, albumen, and salts.*

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Its most important use is in bronchial affections, characterized by profuse secretion, but unaccompanied with fever. It is also beneficial in gastric atony with a catarrhal condition of the mucous membrane, and as a mild stimulant to promote the eruption in exanthematous diseases.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

IODINIUM, I. M. wt. 127. Iodine. Iodum, U. S. P.

The element in heavy brilliant scales, of bluish-black color, peculiar odor, and specific gravity 4.948. It slowly vaporizes at ordinary temperatures; boils at $175^{\circ}C.$ ($347^{\circ}F.$), the vapor being purple or violet-colored.

Solubility.—Soluble in water (7000 parts), glycerine (60 parts); freely in alcohol, ether, chloroform, carbon bisulphide, and in hydrocarbons. Aqueous solutions of hydriodic acid or other iodides dissolve it more or less freely.

Tests.—*Fixed impurities*; residue on heating or treating with the solvents mentioned. *Water*; coherence of the scales and their adhesion to their container. Commercial resublimed iodine is quite pure.

Preparations.—A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 46, Part I.

(Tinct. iodi, U. S. P., contains in each 12.5 parts 1 part of iodine.)

Liquor Iodinii compositus, $\frac{N}{20}$, as follows:

Take of Iodine, <i>two parts</i>	.	.	.	.	.	.	.	2
Iodide of potassium, <i>four parts</i>	.	.	.	.	.	.	.	4
Distilled water, <i>thirty-four parts</i>	.	.	.	.	.	.	.	34

Agitate together until complete solution results.

[Liq. iodi. comp., U. S. P., represents in each 20 parts 1 part of iodine.]

Unguentum Iodinii, $\frac{N}{25}$, as follows:

Take of Iodine, <i>four parts</i>	.	.	.	.	.	.	.	.	4
Iodide of potassium, <i>one part</i>	.	.	.	.	.	.	.	.	1
Water, <i>one part</i>	.	.	.	.	.	.	.	.	1
Benzoinated lard, <i>ninety-four parts</i>	.	.	.	.	.	.	.	.	94

Rub the iodine, iodide of potassium and water, until a smooth mixture is obtained, free from grittiness; then add the lard in small portions, with constant rubbing, until homogeneous. [Equivalent to the U. S. P. ointment.]

Uses.—In medicinal doses iodine acts as a stimulant to the sympathetic or ganglionic nervous system, increasing through it the activity of nutritive, secretory, and circulatory functions, and by its powerful chemical affinities promoting retrograde metamorphosis and elimination of effete materials. It acts as an indirect oxidizing agent, combining with hydrogen of water and freeing oxygen. It is antiseptic, and is serviceable to antagonize the depression caused by the presence of diseased products in the fluids. Its local use, diluted, will destroy fetor in abscesses, and it may be used as a deodorizer by suspending a few grains of the element near the head of a patient. After absorption, it doubtless combines with sodium, and is excreted in that form.

Employed internally, it is markedly useful in chronic engorgement and induration of the cervical, inguinal, salivary, and lymphatic glands; in bronchocele, when the thyroid gland is simply enlarged; in enlargement of the liver and spleen, tabes mesenterica, chronic articular rheumatism, excessive lactation, dry croupy coughs; chronic laryngitis, defective assimilation of fat, menstrual hemorrhages, amenorrhœa, uterine and ovarian hypertrophy and depression of function, and in some chronic diseases of the nervous system, as chorea and some forms of paralysis.

It is a valuable remedy in intermittents, and will often be found curative in these and other fevers, when the derangement of secretion and nutrition are marked, and the products of retrograde change of tissue are imperfectly excreted.

Tinct. iodine is used, topically applied with a brush, to cutaneous eruptions, such as herpes, favus, acne, lupus, etc., to burns and scalds, to prevent pitting of small-pox, to avert superficial erysipelas, and as an application to chronic ulcers in the cavity of the mouth, throat, and uterus; also in the different forms of leucorrhœa, chronic uterine engorgement, gleet, vesical catarrh, chronic dysentery, and ozœna. In enlargement of glands, mammary abscess, and chronic inflammation of joints, it is a valuable application. Its injection into serous cavities is recommended for the purpose of hastening adhesion of their opposite surfaces. For this purpose the tincture is diluted with water; weak

solutions for recent cases and stronger (one of tincture, 4 or 5 of water) for chronic ones. The same method is often curative in cases of cysts, abscesses, and fistulæ. A strong solution, applied until suppuration is induced, is probably the most trustworthy treatment of bites of rabid animals or other poisoned wounds. By inhalation with vapor of water, it is often useful in chronic laryngeal and bronchial affections.

Starch and flour, freely used, antidote its poisonous effects.

Dose.—For local application, the tincture, $\frac{N}{10}$, is preferable, though it may be used internally in doses of gtt. j. to v. = gm. 0.06 to 0.33, in sweetened water, after meals.

Liq. iodinii comp., $\frac{N}{20}$, is convenient for internal use, and diluted for local use or injection, as it is freely miscible with water. By prolonged contact (two months) oil of bitter almonds will dissolve one-third of its weight of iodine, and this solution is sometimes added to cod-liver oil, when iodine is wanted therein.

IODIFORMUM, CHI_3 . M. wt. 394. Iodoform. Methenyl Iodide.

The compound in lemon-yellow scales, of peculiar persistent odor and sweet taste, specific gravity 2.0. It is volatile, subliming at 95°C . (203°F .), and decomposes when heated to 120°C . (248°F .).

Solubility.—Soluble in alcohol (80 parts), chloroform, ether, oils, and carbon bisulphide. Insoluble in cold water, glycerine, diluted acids, and alkaline or earthy hydrates.

Tests.—*Fixed impurities*; imperfect solubility or residuc after burning. Usually pure as found in commerce.

Preparations.—A tincture, $\frac{N}{10}$, as follows:

Iodoform, <i>three parts</i>	.	.	.	.	.	.	.	.	3
Ether, <i>thirteen parts</i>	.	.	.	.	.	.	.	.	13
Alcohol, <i>thirteen parts</i>	.	.	.	.	.	.	.	.	13
Oil of fennel, <i>one part</i>	.	.	.	.	.	.	.	.	1

Dissolve the iodoform in the ether and the oil of fennel in the alcohol; mix the solutions.

An ointment, $\frac{N}{10}$, as follows:

Iodoform, <i>one part</i>	.	.	.	.	.	.	.	.	1
Ungt. paraffini (Sec. 50, Part I), <i>nine parts</i>	.	.	.	.	.	.	.	.	9

Mix together, and for every 1000 parts of ointment, incorporate 1 part of *coumarin*, oil of peppermint, or lavender.

Iodoform and tannin, equal parts powdered together for local use.

Uses.—Used in powder, with or without tannin, or in solution, as an application to irritable and painful ulcers, syphilitic or otherwise, and

to sloughing, ill-conditioned wounds. Local inflammatory swellings and enlarged lymphatic glands are benefited by the solution applied and covered with oiled silk, or by the ointment well rubbed in. The ointment or powder is of reputed benefit applied to ringworms, and in the treatment of ulceration of the cornea, granulations of the eyelids, ciliary blepharitis. In the form of ointment, or suppositories made with cocoa butter base, containing 10 to 12 per cent. of yellow wax (Sec. 29, Part I.), it relieves the pain and improves the condition of hemorrhoids, anal fissures, and ulcers of the rectum. Internally, its benefits, if any, are not well defined. It exerts an anæsthetic influence when in contact with an irritable surface, and is therefore useful in gastralgia, gastric ulcer, cancer, etc., to relieve pain, as would be inferred from its topical action.

Dose.—Gr. j. to ij. = gm. 0.06 to 0.13. Three times per day, in pill.

IPECACUANHA. *Ipecac.*

The root of *Cephælis Ipecacuanha*.

Rubiaceæ, Coffeæ.

A. Richard. Bentley and Trimen.

Constituents.—*Emetia*, or emetina ($C_{30}H_{44}N_2O_8$), an alkaloid, is the most important. It is grayish-white, without odor, quite bitter, freely soluble in alcohol and chloroform, slightly only in water, ether, or fixed oils. It exists in the root associated with *ipecacuanhic acid* ($C_{14}H_{18}O_7$), which is a glucoside, soluble in alcohol, amorphous, and very bitter. It resembles caffeeo-tannic acid. *Resin*, a trace of *volatile oil*, a little *fat*, *starch*, *gum*, and *pectin* are also present.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part. I.

A syrup, $\frac{N}{20}$, as follows:

Take of Tincture of ipecac, $\frac{N}{I}$, or equivalent, <i>five parts</i>	5
Water, a <i>sufficient quantity</i>	q. s.
Sugar, in coarse powder, <i>sixty parts</i>	60

Mix the tincture with 25 parts of water, agitate frequently during a few hours, filter, and add water through the filter in sufficient quantity to make the filtrate weigh *forty (40) parts*. Add the sugar, dissolve by agitation without heat, and strain.

(Equivalent to Syr. *Ipecac.*, U. S. P.)

Uses.—Locally, ipecac is an irritant to both skin and mucous membranes. The bronchial, gastric, and intestinal mucous surfaces are especially influenced by it, and this too, whether swallowed or absorbed by the subcutaneous tissue. Even moderate doses will, by too long

continuance, cause inflammation of the mucous tissue and ulceration of its glands. It is through this tissue the drug is eliminated after absorption. In its passage the drug influences the vascular supply of the excreting surface, and stimulates its glandular apparatus. Minute doses are curative when the pathological condition of the mucous surface is one of passive hyperæmia with altered secretion, which sometimes contains blood. Where active inflammatory symptoms are present, it should be used in connection with aconite or other suitable sedative. The condition indicating ipecac is characterized by symptoms such as follow: prolonged nausea; vomiting of mucus and bile; tongue coated with a white or yellowish pasty coat; diarrhœa with pinching, cutting pain in the umbilical region; offensive, and often bloody, stools; dysentery with greenish or mucous, sometimes bloody, discharges of peculiar cadaveric odor; irritation of the mucous surfaces of nose, mouth, and eyes, with profuse watery secretion; bronchial catarrh with cough and vomiting of mucus; hæmoptysis and spasmodic asthma.

Large doses of ipecac are much in vogue in the epidemic dysentery of malarious and especially of tropical climates. In many of these cases the liver is embarrassed from want of care in eating, and perhaps sudden rise of temperature of the atmosphere. Vomiting relieves this embarrassment, and the irritation of the drug causes simultaneous congestion of the liver, spleen, pancreas, and stomach, with large increase of secretion from the mucous and large glands. The drug provokes this free secretion whether vomiting is produced or not, and when continued, gradually diminishing the dose, the stools become feculent and contain bile, when the tormina and tenesmus cease. The cure probably results partially from the revulsive influence of the congestion of the large glands and stomach, which withdraws the blood and relieves the hyperæmia of the large intestine, and partly from the direct stimulant influence of the minute amounts of the drug absorbed. Possibly the increased glandular activity eliminates a poisonous impurity, which is the cause of the disease. When dysentery is not complicated, as stated, the small dose, frequently repeated, is curative. The emetic influence of ipecac is often useful at the outset of bilious and intermittent fevers, when nausea is present and the tongue is heavily loaded; also to expel accumulations in whooping-cough, suffocative catarrh, bronchorrhœa, capillary bronchitis, and indigestion. In spasmodic croup, emetic doses of the syrup are a common remedy, and it is sometimes useful in the membranous form.

Dose.—As an emetic, the powdered root, or equivalent in tincture,

grs. xx. = gm. 1.33, taken at once, or in divided portions, in warm water or some warm tea.

Ordinarily, for its direct influence on the mucous surfaces, tincture, $\frac{N}{T}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent, to water $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

IRIS FLORENTINA. Orris Root.

The rhizome.

Iridaceæ.

Linné. Bentley and Trimén.

Constituents.—*Soft, acrid resin, tannin*, and a minute amount of *volatile oil* are present.

Uses.—Used principally in powder added to dentifrices as a flavor and stimulant to the gums. It was formerly occasionally used as a stimulant to the gastric, intestinal, and bronchial mucous surfaces, through which its active constituents are doubtless eliminated. It is a feeble agent.

IRIS VERSICOLOR. Blue Flag.

The fresh rhizome.

Iridaceæ.

Linné. Gray.

Constituents.—An acrid, soft *resin*, which seems to represent the medicinal virtues of the root; *starch* and *tannin*, have been determined as present. A variety, the interior of whose rhizome is purplish in color, is the most active.

Preparations.—A tincture, $\frac{N}{T}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Resina Iridis, prepared as in Sec. 27, using the root prepared as for normal tincture, and employing the same solvent with it.

Uses.—The curative action of *Iris vers.* depends upon its power of directly stimulating the glandular system, lymphatics, and skin. This influence is especially marked in cases of the salivary glands, pancreas, and glands of the upper part of the gastro-intestinal tract, including the liver. It is a powerful agent, in appreciable doses, to promote waste and elimination of impurities from the blood; with this view it is employed in syphilis, eruptions such as *eczema*, *prurigo*, *crusta lactea*, *tinca*, and in glandular enlargements, as of the thyroid, etc. In small doses, it is indicated in irritable conditions of the mucous membrane of the digestive tract with altered secretion, which causes a burning distress as though from an acid liquid. This condition is characterized by such symptoms as neuralgic pain over one eye, or involving one side of the face, usually the right side; vomiting of acid liquid, or nausea, with

burning distress in the œsophagus or stomach; gastralgia and gastrodynia, with vomiting or rising of food, especially after fats or rich pastry; diarrhœa, with a burning sensation after a passage; cholera morbus, with violent pain around the umbilicus, or in the lower part of the abdomen, and watery diarrhœa, with great depression.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent to water $\frac{3}{4}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00). The resin may be used in doses of grs. ss. to ij. = gm. 0.03 to 0.13, as a laxative and stimulant to the liver when embarrassed, the stools being light-colored and passed with difficulty. In skin diseases and glandular enlargements, the tincture may be used locally as well as internally.

JALAPA. Jalap.

The tuber of *Exogonium Purga*, *Benth.*, or *Ipomea Jalapa*, *Nuttall*.

Convolvulaceæ.

Bentley and Trimen.

Constituents.—*Resin* (15 to 20 per cent.) is the most important. It is soluble in and extracted by alcohol. About 10 per cent. of the amount thus obtained dissolves in ether. It is composed mainly of the glucoside convolvulin ($C_{62}H_{100}O_{32}$), which, when pure, is colorless, inodorous, tasteless, and, in thin layers, transparent. It reacts slightly acid, is soluble in alcohol, insoluble in ether, readily soluble in alkalies, from which it is not reprecipitated by acids, but is converted into a peculiar acid, convolvulic. Convolvulin (also known as rhodeoretin) is strongly purgative. The portion of the resin dissolved by ether is also soluble in alkalies, from which it precipitates on adding an acid. It is brown in color, acid reaction, and acrid taste. Jalap also contains *sugar, starch, gum, and extractive matters*, which are without medicinal value.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

Resina Jalapæ, as in Sec. 27, Part I.

[Abstractum Jalapæ, U. S. P. = $\frac{N}{2}$.]

Uses.—The action of jalap seems to be entirely local, and to more especially affect the alimentary canal below the stomach. It causes profuse watery secretion from the intestinal surface, and, in large doses, nausea, vomiting, tormina tenesmus of great severity, and blood may be present in the copious liquid dejections which invariably result when it is given. Increased flow of bile results, as well as stimulation of the

intestinal glands. Its principal uses has been in constipation due to torpor of the intestinal glands, as a vermifuge, and as an agent to remove dropsical effusions by provoking profuse watery evacuations. Its action in minute doses should be studied in irritable conditions of the intestinal tract.

Dose.—Of the powdered root, or equivalent, grs. xv. to xx. = gm. 1.00 to 1.33. The resin will average five times the strength of the drug.

JEFFERSONIA DIPHYLLA. Twinleaf.

The fresh rhizome.

Berberidaceæ.

Barton. Gray.

Constituents.—An acrid principle *saponin*, a *white alkaloid*, and the alkaloid *berberina*, have been determined as present; also *tannin* and the common non-medicinal constituents of plants.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This agent is stimulant to mucous surfaces when employed in medicinal doses. When the condition seems one of passive engorgement of the vessels with excessive and tenacious secretion, stimulant doses of this drug will change the character of the secretion, promote its removal, and excite vascular activity. It somewhat resembles senega in its action on the bronchial surfaces.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

JUGLANS CINEREA. Butternut.

The fresh inner bark of the root collected in May or June.

Juglandaceæ.

Linné. Bentley and Trimén.

Constituents.—*Fixed oil*, a trace of *volatile oil*, *tannin*, *resin*, and a volatile acid, *juglandic acid*, which has also been called *nucin* and *juglone* ($C_{36}H_{12}O_{10}$). *Juglone* has an acid reaction, acrid taste, is soluble in alcohol and ether, and crystallizes in orange-yellow needles, which are but slightly soluble in water. It is probably the most important of the constituents.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

An extract made by evaporating the tincture, by means of a water-bath, until a pilular solid remains.

Uses.—*Juglans* exerts a direct influence upon the skin and intestinal canal. It resembles *Iris vers.*, but has less marked affinity for the

stomach and glands of the upper part of the alimentary tract, although influencing with greater energy the colon, rectum, small intestine, liver, and skin. Large doses produce large bilious evacuations without much pain or griping: medium doses are curative in many chronic skin diseases, as herpes, eczema, lichen, ecthyma, etc. Small doses are often successful in dysentery, bilious diarrhœa, and in intestinal diseases with symptoms indicating irritability or a tendency to inflammation. Minute doses have also been employed with success in acute forms of skin diseases, but must be given with caution.

Dose.—Tincture, $\frac{N}{1}$, gtt. ss. to xxx. = gm. 0.33 to 2.00, or equivalent.

JUNIPERUS COMMUNIS. Juniper.

The fruit.

Coniferæ, Cupresseæ.

Linné. Bentley and Trimen.

Constituents.—*Resin, sugar, fat, wax, acetic and formic acids, protein compounds, malates, volatile oil, and juniperin.* Juniperin is light yellow, non-crystalline, soluble in alcohol and ether, and slightly in water. *Oleum Juniperi* is yellowish-green or colorless, of specific gravity .85 to .90 when fresh, but thickens on exposure and turns reddish-brown. It consists of two oils, which have the formula ($C_{10}H_{16}$), and differ in their degree of volatility; the most volatile oil, which is only obtained from the ripe fruit, is soluble in alcohol, colorless, and forms a liquid camphor with hydrochloric acid gas; the less volatile oil is soluble to a small extent only in alcohol and is colored. When oil of juniper is adulterated with turpentine, a solid camphor-like body is produced with hydrochloric acid-gas. This reaction, with the different odor, will serve to detect the adulteration.

Oleum Cadinum, or oil of cade, is the name given to a substance which resembles in appearance and odor common pine tar, and which is obtained by destructive distillation from the wood of *Juniperus oxycedrus*, Linné, and perhaps other species. It is imported from the south of France. It may be prepared in the form of a glycerite, *Glyceritum Ol. cadinum*, $\frac{N}{10}$, as in Sec. 22, *b*, Part I., or may be mixed with equal parts of soft-soap and flavored with oil of lavender. Used as a local application in skin diseases, such as ichthyosis, chronic eczema, impetigo, etc.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

The oil obtained by distillation with water.

A tincture of the oil, $\frac{N}{50}$, as follows:

Take of Oil of Juniper, <i>two parts</i>	.	.	.	.	.	.	2
Alcohol, <i>ninety-eight parts</i>	.	.	.	.	.	.	98

Dissolve the oil in the alcohol.

Note.—A mixture of *Ol. juniper Tinct.* $\frac{N}{50}$ (8 parts), *Ol. carui Tinct.* $\frac{N}{50}$ (1 part), *Ol. fœnieuli Tinct.* $\frac{N}{50}$ (1 part), alcohol (50 parts), and water (40 parts), is equivalent to gin, and is of more uniform composition. [Equivalent to *Spiritus juniperi compositus*, U. S. P.]

Uses.—The medicinal power of juniper resides mainly in the oil, which readily enters the blood, increases arterial pressure, and is eliminated chiefly by the kidneys. It powerfully stimulates the functions of the kidneys, and somewhat that of the skin and organs of reproduction. It is principally employed in infusion, often as a vehicle for saline diuretics in dropsy of cardiac or renal origin. It may be used in the same class of cases in which turpentine is indicated. In large doses it will produce strangury and bloody urine. It is employed in domestic practice in cases of dysmenorrhœa and amenorrhœa, and is usually given in infusion, or in the form of Holland gin, of which the oil is a constituent. In acute renal affections it must be employed cautiously and in minute doses.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.
Ol. juniperi, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

JUNIPERUS VIRGINIANA. Red Cedar.

The fresh tops.

Coniferæ, *Cupressæ*.

Linné. Gray.

Constituents.—*Resin, volatile oil, fat, and tannin* are the important constituents. The oil of red cedar wood separates by cold into a solid, cedrin camphor ($C_{15}H_{26}O$), soluble in alcohol, and with a peculiar aromatic odor, and a liquid cedren ($C_{15}H_{24}$), which is colorless, differs from the camphor in taste, being quite pungent.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used in conditions in which savin is indicated (see *Sabina*), though it is more feeble.

Dose.—Gtt. j. xv. = gm. 0.06 to 1.00.

KALMIA LATIFOLIA. Mountain Laurel.

The fresh leaves.

Ericacæ, *Ericinæ*.

Linné. Gray.

Constituents.—*Resin, tannin, arbutin* (see *Uva Ursi*), an acrid principle not fully examined; a principle resembling mannite, gum, and other common constituents of plants are present.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—In large doses this remedy produces a marked depression of the circulation, feeble, sometimes irregular, action of the heart, slow and feeble pulse, vertigo, blindness, and impairment of both motion and sensibility.

Medicinally it has been recommended when there is hypertrophy with excessive action of the heart, in febrile and inflammatory diseases, in active hemorrhages, diarrhœa, dysentery, and in syphilis. In chronic inflammations involving the white fibrous tissue, whether of syphilitic or rheumatic origin, it often proves an effective remedy. The drug has not had the study it deserves.

Dose.—Add tincture, $\frac{N}{I}$, gtt. v. to xx. = gm. 0.33 to 1.33, or equivalent, to water $\bar{3}$ iv. = gm. 128.00. Teaspoonful dose (gm. 4.00), repeated or increased with caution.

KAMALA. Kameela.

The powder and hairs obtained from the capsules of *Mallotus philippinensis*. *Mueller*.

Euphorbiaceæ.

Bentley and Trimen.

Constituents.—The important constituents are two *resins*, one freely soluble in cold alcohol, and having the composition $C_{15}H_{18}O_4$, the other but partially soluble, and of the composition $C_8H_{12}O_5$. The fresh drug is said to yield a peculiar principle called *rotelerin* ($C_{22}H_{12}O_6$), crystallizing in yellow silky needles from their solution in ether. *Gum, tannin, citric* and *oxalic* acids are also present.

Preparations.—A tincture, $\frac{N}{I}$, with diluted alcohol, as in Sec. 40, Part I.

Uses.—As an efficacious remedy against tapeworm in doses of $\bar{3}$ j. to $\bar{3}$ ij. = gm. 4.00 to 8.00, of the powder, or equivalent in tincture mixed with some aromatic water or suspended in syrup. Repeat, if required, at intervals of three hours. No purgative is required before or after the kameela.

KINO. Kino.

The inspissated juice of *Pterocarpus Marsupium*, *Roxburgh*, obtained from incisions in the trunk of the tree. It is also obtained from other analogous plants.

Leguminosæ, Papilionaceæ. De Condolle. Bentley and Trimen.

Constituents.—*Kino-tannic acid*, which is closely related chemically

to catechu-tannic acid ($C_{13}H_{12}O_5$), is the most important constituent. A small amount of *pyrocatechin* with *red coloring matters* are present, the first in but small amount. Kino is partially soluble in cold water, more freely in boiling-water, and almost entirely in alcohol.

Preparations.—A tincture, $\frac{N}{10}$, as follows:

Take of Kino in fine powder, <i>two parts</i>	2
Alcohol, <i>twelve parts</i>	12
Water, <i>three parts</i>	3
Glycerine, <i>three parts</i>	3

Mix the fluids, rub the kino in a mortar with a portion of the mixture until a smooth paste results, transfer to a bottle, add the remaining menstruum, and shake occasionally during 24 hours; then filter, adding sufficient of the menstruum through the filter to make *twenty (20) parts*.

[Equivalent to Tinetura kino, U. S. P.]

Uses.—Used for its astringent influence in checking excessive discharges, as in diarrhœa, catarrh of the stomach with pyrosis, excessive urination in diabetes, and locally in leucorrhœa and dysentery. It is feebler than tannin and many other pure astringents, but seems to have some tonic power, and is less irritating, hence more desirable for internal use.

Dose.—Grs. x. to xx. = gm. 0.66 to 1.33, or equivalent.

KRAMERIA TRIANDRA. Rhatany.

The root obtained from Bolivia and Peru.

Polygalacææ, Krameriacææ.

Bentley and Trimen.

Constituents.—*Ratanhia-tannic acid* ($C_{26}H_{24}O_{11}$), about 20 per cent. in amount, is the most important constituent. *Wax, gum,* and *sugar* are also present. Some authorities claim the presence of a peculiar acid, kramerie acid, which, however, is not clearly described.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A glyeerite, $\frac{N}{1}$ (for local or internal use when alcohol is objectionable), as follows:

Take of Tincture, $\frac{N}{1}$, <i>three parts</i>	3
Glycerine, <i>one part</i>	1
Water, <i>one part</i>	1

Mix together, and recover the alcohol by distillation, or remove it by evaporation at the temperature of a water-bath; filter, and add water through the filter sufficient to make *three (3) parts*.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

[Ext. *Krameria*, U. S. P., is approximately of the strength $\frac{8N}{1}$, and is in the form of irregular non-hygroscopic pieces. It is extracted with cold water. Tinctura *Krameria*, U. S. P. = $\frac{N}{5}$.]

Uses.—Chiefly used for its astringent influence in restraining profuse mucous discharges, passive hemorrhages, and for the states of relaxation and debility which accompany such fluxes. It is employed locally by injection in vaginal leucorrhœa, dysentery, and in the treatment of anal fissures. The latter difficulty is treated by injection night and morning (after unloading the rectum by enema) of ʒij. = gm. 8.00 of the extract, $\frac{4N}{1}$ (ʒj. = gm. 4.00 of Ext., U. S. P.), dissolved in ʒv. = gm. 160.00 of water; or better, an equivalent amount of the glycerite, $\frac{N}{1}$.

Dose.—Internally, tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

LACTUCA ELONGATA. Wild Lettuce.

The fresh flowering herb.

Compositæ, Ligulifloræ.

Constituents.—No analysis of this species has been published, but from its sensible properties its constituents are probably analogous, if not identical, with those of the *L. virosa* or of *Lactucarium*, which is obtained from that and other species of *lactuca*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—For many years lettuce has received credit for soporific properties, similar in kind, but differing in degree, from those of opium. Recent observers are rather inclined to discredit the existence of such powers, or to consider them so feeble as to be practically useless. The *L. elongata* resembles the *L. virosa* of European growth, and the tinctures from the fresh plant are useful to allay sleeplessness due to simple cerebral hyperæmia, and to diminish sensibility when pain exists, depending on vascular excitement. It may thus prove of value in irritable coughs, as of phthisis, in painful nervous disorders, and to relieve nervous irritability and watchfulness in fevers, etc. The drug more nearly resembles hyoscyamus than opium, and may be used in conditions when the latter is positively contraindicated.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xxx. = gm. 0.33 to 2.00, or equivalent.

A more efficient preparation than ordinary *lactucarium* (which see) may be prepared by evaporating the tincture to dryness. The garden lettuce (*L. sativa*) has similar properties, and may be prepared from the

fresh plant in bloom in the same manner. It is more feeble in power than the above.

LACTUCARIUM. *Lactucarium.*

The substance remaining after the spontaneous evaporation of the milky juice obtained by incisions in the stalks of *Lactuca sativa* or *L. virosa*.

Compositæ, Ligulifloræ.

Bentley and Trimén.

Constituents.—*Lactucerin* or *lactucon* ($C_{16}H_{26}O$), which, when pure, is colorless, crystalline, without odor or taste, freely soluble in alcohol, ether, and oils; *lactucin* ($C_{11}H_{12}O_3 \cdot H_2O$), bitter, crystalline, soluble in alcohol and hot water; two uncrystallizable *bitter principles*, soluble in alcohol and water; a *volatile substance* of peculiar odor, whose real nature is not accurately settled; *lactucic acid* and *lactuopicrin*, the latter probably a product of decomposition; *asparagin*, *resin*, *mannit*, *oxalic*, *citric*, and *malic* acids, *gum* and *albumen* are present. The volatile principle is not present to the same extent as in the fresh plant, and the variable amount in different samples of lactucarium probably accounts for the variable results obtained in its use, although the bitter principles doubtless represent much of the medicinally valuable matter.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as follows:

Take of <i>Lactucarium</i> , <i>one part</i>	.	.	.	.	.	.	.	1
Alcohol, <i>one part</i>	.	.	.	.	.	.	.	1

Triturate the lactucarium in a mortar, with the alcohol added in divided portions, until a smooth uniform mixture results. Transfer the mixture to a bottle and macerate, with frequent agitation, for 14 days; filter, and add alcohol through the filter until the liquid weighs *one* (1) *part*.

Uses.—The utility of lactucarium as a remedy is questionable. The virtues of lettuce are doubtless best represented in a tincture of the fresh plant. (See *Lactuca Elongata*.)

Dose.—This is indefinite owing to the variability of the drug. Grs. ij. = gm. 0.13, or equivalent, may be given to an infant, adults in proportion. The tincture, $\frac{N}{1}$, may be mixed with 19 parts of simple syrup, which will be equivalent to Syr. lactucarii, U. S. P.

LAPPA OFFICINALIS. *Burdock.*

The recent root (*L. major*).

Compositæ, Cynareæ.

Gray.

Constituents.—*Resin*, a bitter principle, a little tannin, *inulin*, *mucilage*, and *sugar*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Used to promote the activity of the secreting organs, especially the skin and kidneys. It is a useful remedy in obstinate chronic cutaneous eruptions, glandular engorgement, scrofulous or syphilitic, gouty and rheumatic difficulties of long standing, dropsy of renal origin, and in dysuria and other vesical disorders. Some testimony would indicate that the recent leaves are still more active than the root, and exert a decided influence on all mucous surfaces, and especially those of the intestinal canal. Their use should be investigated. The tincture, prepared from the fresh leaves, as in Secs. 41 and 44, Part I., will represent the drug in a convenient form.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xxx. = gm. 0.33 to 2.00, or equivalent. The remedy should be continued for a long time in obstinate, chronic cases.

LARIX AMERICANA. American Larch.

The fresh bark deprived of the outer layer, obtained from branches and small trees.

Coniferæ, *Abietinæ*.

Michaux. Gray.

Constituents.—These have not been determined, but are probably similar to those of *L. Europæa*, which see.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—As a substitute for the European larch for its direct influence on mucous membranes and skin.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent.

LARIX EUROPÆA. European Larch.

The recent bark deprived of the outer layer, obtained from branches and small trees (*Pinus larix*, *Linné*).

Coniferæ, *Abietinæ*.

De Condolle.

Constituents.—*Larixinic acid* ($C_{10}H_{10}O_5$), a volatile, colorless, crystalline acid, resembling benzoic acid in appearance, having a camphoraceous odor, astringent, and somewhat bitter taste, readily soluble in alcohol and hot water, and partially in ether; *resinous matter* probably identical with Venice turpentine of commerce (*Terebinthina laricina*).

which is a secretion obtained from the heart wood of this tree, and is of a greenish-yellow color, usually transparent and slightly fluorescent, occasionally slightly opaque, and has an agreeable terebinthinate odor, and bitterish, aromatic taste. In therapeutic properties it is allied to turpentine, which see. *Tannin*, *sugar*, and *mucilage* are also constituents of the bark of *L. Europæa*. An exudation found on the leaves of this tree in summer and consisting largely of the sugar melezitose ($C_{12}H_{24}O_{12}$) is known as Briançon manna.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Used in chronic bronchial and urinary disorders characterized by profuse secretion of mucus or mucopus, and in the absence of febrile movement. It also has a direct influence on the skin, as shown by its successful employment in purpura hemorrhagica.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent.

LAURUS NOBILIS. Bay Laurel.

The leaves.

The fruit or berries.

Lauraceæ.

Linné. Bentley and Trimen.

Constituents.—The fruit yields, by steeping in hot water and expressing, a mixture of volatile and fixed oil of buttery consistence, green colored and peculiar odor, soluble in ether and partly in alcohol. It is known as *Oleum Lauri* (P. G.). A *volatile oil* may be obtained from the leaves and fruit, which consists of a volatile elæopten and a solid stearopten, the latter of which is called laurostearin.

Uses.—Its medical uses are almost obsolete. The leaves are occasionally employed in cooking to flavor pastry. The oils are sometimes used as local stimulants to relieve painful conditions, as in bruises, sprains, and rheumatism.

Both leaves and berries were formerly used as stimulants to digestion, to relieve flatus, and as emmenagogues.

LAVENDULA VERA. Lavender.

The fresh flowers.

Labiataæ, Nepetææ.

De Condolle. Bentley and Trimen.

Constituents.—A volatile oil, *Oleum Lavendulæ*, which is of specific gravity .87 to .91, according to age, colorless to greenish-yellow in appearance, soluble freely in alcohol, of a pungent, somewhat bitter taste, and is composed of a hydrocarbon ($C_{10}H_{16}$), and a less

volatile stearopten, said to be identical with camphor; *tannin*, *resin*, and a *bitter principle* are present.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A tincture, $\frac{N}{50}$, of the oil made by dissolving *two parts* of the oil in *ninety-eight parts* of alcohol.

(Spts. Lavendulæ, U. S. P. = $\frac{8N}{100}$.)

(Tinct. Lavendulæ comp., U. S. P., contains the oil in the proportion $\frac{N}{125}$.)

Uses.—Used in nervous depression and hysteria as a stimulant, and as a carminative in flatulency. The Tinct. Ol. Lavendulæ, $\frac{N}{50}$, may be used internally in doses of gtt. xv. to 3j. = gm. 1.00 to 4.00, but is most employed as a grateful application to the forehead in fevers and headache. In palpitation and depression of hysterical origin it is a prompt remedy. The tincture, $\frac{N}{2}$, of the flowers may be used when its internal use is required.

Dose.—Tincture, $\frac{N}{2}$, gtt. x. to 3j. = gm. 0.66 to 4.00.

LEDUM PALUSTRE. Marsh Tea.

The recent plant.

Ericaceæ, *Ericinææ*.

Linné.

Constituents.—A *volatile oil* containing ledum camphor, and a volatile portion containing ericinol ($C_{10}H_{16}O$). This last substance is found in several plants of the family, or is obtained from them by the decomposition of a glucoside ericolin ($C_{34}H_{56}O_{21}$), which they contain. A peculiar tannin, *leditanic acid* ($C_{14}H_{12}O_6$), *resin*, *wax*, *citric acid*, *valerianic* and other *volatile acids* are reported present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This plant is poisonous to parasites that infest the skin of animals, and to bed-bugs. It is employed in strong decoction as a wash, or the fresh plant is laid among the woollen articles to be protected from moths.

Internally it is used for its influence on the skin in diseases characterized by tingling and itching, with a papular (as in lichen) or eczematous eruptions. It is claimed by homœopathic authors that it will relieve the tensive pains of gouty or other swellings of the small joints, and such as arise from penetrating wounds of sharp instruments, or stings and bites of insects; also diarrhœas, dysenteries, and coughs following the retrocession of an eruption.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to x. = gm. 0.33 to 0.66 to water $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

LEONORUS CARDIACA. Motherwort.

The fresh plant.

Labiatae, Stachydeæ.

Linné. Gray.

Constituents.—A *volatile oil* and a *bitter principle* (neither of which have been examined) are present with the usual constituents common to all plants.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug is a mild, vascular stimulant, increasing the functional activity of the skin and kidneys. It especially influences the vascular and nervous systems of the pelvic organs, allays spasm and nervous irritability, promotes secretion, and reduces febrile excitement. It is a valuable remedy in suppressed or scanty lochia, with fever and nervous excitement, and in suppressed or scanty menses, from cold or nervous shock. It has usually been used in infusion or in large doses of the expressed juice. The tinctures are more convenient and equally effective. It deserves careful study with special reference to its influence on the nervous system.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to $\bar{3}$ j. = gm. 0.33 to 4.00, or equivalent.

LEPTANDRA VIRGINICA. Black Root.

The fresh rhizome and rootlets.

Scrophulariaceæ.

Nuttall. Bentley and Trimen.

Constituents.—A *volatile alkaloid* in small amount; a *bitter glucoside*, soluble in alcohol, water, and ether; *resin*, soluble in alcohol; *saponin*, *tannin*, and a trace of *volatile oil*.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A dried extract, $\frac{4N}{I}$, from the recently dried root, with alcohol, as in Sec. 20, Part I.

The resin, dried and powdered, prepared from the recently dried root, with alcohol, as in Sec. 27, Part I.

Uses.—This remedy is used for its direct influence on the portal circulation, which it stimulates, and the liver and glands of the intestinal tract, whose functional activity it increases. It is usefully employed in chronic dysentery and diarrhœa, cholera infantum, remittent, intermittent, and typhoid fevers, and in diseases of the liver when the symp-

toms indicate embarrassment of the portal circulation and depressed function of the liver and intestinal glands.

Dose.—Tincture, $\frac{N}{i}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

The resin and powdered extract are not so active as the tinctures, as neither represent the volatile constituents of the drug. Both, however, are valuable medicines. The resin is most efficient when thoroughly triturated. Dose, grs. j. to ij. = gm. 0.06 to 0.13.

LEVISTICUM OFFICINALE. Lovage.

The recent root (*Ligusticum levisticum*, *Linné*).

Umbelliferæ, *Orthospermæ*.

Koch.

Constituents.—*Volatile oil*, which is quite thick from the presence of much stearopten, hard and soft *resins*, one of which is bitter and pungent, *sugar* and *gum*.

Preparations.—A tincture, $\frac{N}{i}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Used as an aromatic stimulant and tonic to the digestive tract. It increases arterial pressure somewhat, and promotes functional activity of the kidneys and the reproductive organs of the female. It is employed to relieve flatulence, to quiet hysterical excitement, in dropsy and amenorrhea.

Dose.—Tincture, $\frac{N}{i}$, gtt. x. to 3ss. = gm. 0.66 to 1.00, or equivalent.

LIATRIS SPICATA. Button Snake-Root.

The recent tuberous rhizome.

Compositæ, *Eupatoriæ*.

Wildenow. Gray.

Constituents.—No accurate analysis is published. *Volatile oil* and *acrid resin* are among its constituents.

Preparations.—A tincture, $\frac{N}{i}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—This remedy is a vascular stimulant, and increases the function of skin, kidneys, and mucous membranes. It is a valuable remedy in colic from indigestion, in catarrhal diseases of the urinary tract, in chronic rheumatism, and convalescence from the acute form, when the urine is deficient in quantity and contains urates. It is one of the many articles recommended as an antidote to the bite of venomous reptiles, and more recently to that of rabid animals. It is administered freely in decoction made with milk, and applied locally in poultices after cauterization.

Dose.—Tincture, $\frac{N}{i}$, gtt. x. to xv. = gm. 0.33 to 1.00, or equivalent.

LIGUSTRUM VULGARE. Privet.

The leaves.

Oleaceæ.

Linné.

Constituents.—Two *bitter principles*, ligustrin and ligustron, the latter of which is crystalline, are said to be present, with *tannin* and other common constituents of plants.

Uses.—Principally used in infusion, as a gargle, in relaxation and irritation of the mucous surfaces of the mouth and throat. It is powerfully astringent, and has been employed to restrain hemorrhage.

LILIUM TIGRINUM. Tiger Lily.

The fresh plant in flower.

Liliacæ.

Constituents.—No analysis has been published.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This remedy is claimed by homœopathic writers to exert a direct action upon the generative organs of women, and to be curative in disorders characterized by “bearing down in the uterine region with a feeling as though the pelvie viscera were being dragged downwards through the vagina,” depression of spirits, and reflex palpitation of the heart. It deserves further study.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent, to water $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

LINARIA VULGARIS. Toad Flax.

The fresh plant in flower. (Antirrhinum linaria, Linné.)

Scrophulariaceæ.

Miller.

Constituents.—The heavy, disagreeable odor of the fresh plant would indicate the presence of a *volatile principle*, though none has been reported. *Yellow coloring matter, sugar, and mucilage* are present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

An ointment, $\frac{N}{10}$, as follows:

Take of Tincture, $\frac{N}{1}$, two parts	2
Ungt. Paraffini	q.s.

Add the tincture to 8 parts of the ointment, and keep the mixture

warm upon a water-bath until the liquid has evaporated; then add ungt. paraffini to make the weight *ten parts*, and stir until cool and partly congealed.

Uses.—This remedy has been but little used in this country, but possesses an influence upon the skin, vascular system, and glandular apparatus, which makes it worthy of careful study. It has been employed with success in stubborn cutaneous diseases, in dropsy, and jaundice. Locally, in infusion or ointment, it is used in skin diseases, and as an application to painful hemorrhoids.

Dose.—Tincture, $\frac{N}{i}$, gtt. j. to 3ss. = gm. 0.06 to 2.00, or equivalent.

LINUM USITATISSIMUM. Flax Plant.

The seed. (Linum, U. S. P.)

Linaceæ.

Linné. Bentley and Trimen.

Constituents.—*Resin, wax, sugar, protein matters, salts, fixed oils, and mucilage*; the last two being the important constituents. The oil, *Oleum Lini*, is contained in the embryo to the extent of 30 to 40 per cent., and is composed of the glycerides linolein (80 per cent.), palmitin, myristin, and some elain; when expressed without heat, it is of bland taste, limpid, neutral, and of a yellowish color.

It solidifies on long exposure, and when boiled this takes place in a brief time; when it contains mucilaginous matters, it rapidly rancidifies on exposure. The mucilage, which is present in large amount in the oil, makes the ground seed especially useful in poultices. (See *Cataplasmata*, Sec. 16, Part I.)

Uses.—The oil is somewhat laxative, and is occasionally used in the treatment of hemorrhoids. Dose of cold pressed oil, 3j. = gm. 32.00. It is also employed as a constituent of *Linimentum calcis* (see *Calx*), as an application to burns. Flaxseed meal is used as a basis for poultices (see *Cataplasmata*). The seeds are used, in infusion, as a demulcent drink, and as a local application in inflammatory conditions of mucous surfaces.

LIQUIDAMBAR STYRACIFLUA. Sweet Gum.

The yellowish, balsamic exudation freshly gathered.

The fresh bark.

Hamamelaceæ, Balsamifluæ.

Linné. Gray.

Constituents.—The properties of sweet gum are fully represented in the balsamic exudation, which seems to be of nearly identical composition with storax (*styrax officinale*). Its constituents are a volatile,

aromatic hydrocarbon, seemingly identical with *styrol* (C_8H_8), *cinnamic acid*, *styracin* or *styril cinnamate* ($C_9H_9, C_9H_7O_2$), and *resin* with no taste or odor. The balsam is soluble, when pure, in alcohol, ether, and chloroform.

Preparations.—From the bark :

A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

From the balsam (*Balsamum Liquidambar*) :

A tincture, $\frac{N}{10}$, as in Sec. 46, Part I.

Uses.—Useful in chronic catarrhal conditions of the mucous surfaces of the respiratory and urinary organs, as in bronchorrhœa, cystitis, pyelitis, gleet, etc. Locally, in solution, it is useful as a stimulant to unhealthy, indolent, and offensive ulcers, to burns and frost bite. It may be applied in solution or an ointment made by adding the balsam to lard or ungt. paraffini. The balsam may be used in alcoholic or ethereal solution ($\frac{N}{100}$), by spray, to control excessive secretion from the bronchial mucous membranes.

A syrup may be prepared as from Bals. Tolu.

Dose.—Tincture, $\frac{N}{10}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent. Bals. Liquidambar, *Tinct.* $\frac{N}{10}$, may be considered equivalent to Cort. Liquidambar Styr., *Tinct.* $\frac{N}{1}$.

LIQUOR AMMONII ACETATIS. Solution of Acetate of Ammonium.

An aqueous solution containing about 7.2 per cent. of neutral ammonium acetate ($NH_4C_2H_3O_2$), with some carbonic acid gas, which results from the process of preparation, and is lost from age and exposure. The freshly prepared solution is clear, colorless, without smoky odor, of pungent (from carbonic acid gas), followed by a saline taste, and of specific gravity 1.022.

Tests.—*Fixed alkaline or earthy salts*; residue on evaporation and strongly heating; when pure, it is completely volatile. *Sulphates and chlorides*; precipitate with solution of barium nitrate for the former, or with solution of argentic nitrate for the latter, from solution acidulated with nitric acid.

Uses.—This preparation, which should be freshly made when dispensed, may be extemporized by adding to 1 part of powdered ammonium carbonate, dissolved in 20 parts of water, three parts of acetic acid. The solution of carbonate may be filtered if not clear, before adding the acid. A slight excess of acid is not objectionable.

This remedy is valuable in conditions requiring increased activity of

the circulation and secretions. It promotes exhalation by the skin, and is therefore quite useful in fevers of a mild type, as in common catarrh. It is a valuable stimulant, sustaining the vital powers in typhus and other low fevers. It is also useful to neutralize the effects of drunkenness, to assist the flow in painful and difficult menstruation, and to control excessive menstruation due to passive engorgement and sluggish circulation in the pelvic vessels.

Dose.—Gtt. x. to \mathfrak{z} ss. = gm. 0.66 to 16.00. The larger dose is used only in cases of extreme prostration, as from drunkenness. A small or medium dose, repeated as its effects subside, is most commonly indicated.

LIQUOR FERRI NITRATIS. Solution of Ferric Nitrate.

A pale-yellow, transparent liquid, of specific gravity 1.050. It is a solution of ferric nitrate (Fe_26NO_3 . M. wt. 484), free from ferrous salt, and yields, with ammonia in excess, a precipitate of ferric hydrate, which, when well washed, dried, and ignited, weighs between 1.7 and 2 parts for each hundred parts of solution (same as U. S. P.). It contains about 6 per cent. of the anhydrous ferric nitrate.

Tests.—*Ferrous salt*; blue precipitate with solution of ferridecyanide of potassium. *Copper*; blue color of liquid obtained by filtering a mixture of the solution of ferric nitrate and excess of ammonium hydrate. *Zinc*; white turbidity on addition of solution of ammonium sulphide to filtrate from previous test. *Chlorides*; white precipitate on addition of solution of silver nitrate to the dilute solution. *Sulphates*; white precipitate with solution of barium nitrate to diluted solution.

Uses.—This salt is used for essentially the same conditions as other preparations of iron. It is, however, more astringent than the compounds with the organic acids, though not so much so as the chloride and sulphate. It is useful in checking losses of fluids, due to laxity of fibre and passive vascular engorgements, as in diarrhœa, leucorrhœa, and menorrhagia. Hæmatamesis is also arrested by it in doses of one or two drops in cold water, frequently repeated.

Used locally, diluted, for its astringent influence.

Dose.—Gtt. j. to x. = gm. 0.06 to 0.66, diluted.

LIQUOR FERRI SUBSULPHATIS. Solution of Ferric Oxysulphate. Monsel's Solution.

A syrupy solution of ferric oxysulphate ($5(\text{Fe}_23\text{SO}_4)\text{Fe}_26\text{HO}$), specific gravity 1.555, free from ferrous salt. It is inodorous, of a ruby-red color, very astringent taste, but without causticity. When exposed

to a moderate heat in the presence of moisture (as near escaping steam), it dries to a light-yellow, pulverulent mass of basic ferric oxysulphate, which is found in commerce under the name of Monsel's salt, or sometimes persulphate of iron. The solution is freely miscible with glycerine, alcohol, and water. It contains 43.7 per cent. of the salt.

Tests.—*Ferrous salt*; blue precipitate on addition of solution of ferri-cyanide of potassium to a portion of the diluted liquor. *Copper*; blue color of filtrate after addition of excess of aqua ammoniæ to a small portion of the diluted liquor, heating and filtering. *Zinc*; white precipitate or turbidity on addition of solution of ammonium sulphide to filtrate of previous test. *Nitric acid, or nitrates*; decoloration of a few drops of solution of potassium permanganate on boiling with a portion of the filtrate (obtained as in test for copper) which has been oversaturated with strong sulphuric acid. *Earthy alkaline or metallic impurities*; residue on evaporation and ignition of a portion of filtrate obtained as in test for copper.

Uses.—As a local styptic in cases of hemorrhage, accessible for its application by brush, sponge, or atomizer. It is less irritating than other acid ferric salts. A saturated aqueous solution of Monsel's salt is claimed by some to be milder than the solution as ordinarily prepared. When used by atomizer, a dilution with water sufficient to represent one or two per cent. of the liquor is strong enough.

LIQUOR FERRI TERSULPHATIS. Solution of Ferric Sulphate, or Tersulphate of Iron.

A solution of ferric sulphate ($\text{Fe}_2\text{3SO}_4$), specific gravity 1.320, of dark reddish-brown color, acid and styptic taste, and free from ferrous salt; 100 parts yield, on addition of excess of aqua ammoniæ, a precipitate of ferric hydrate ($\text{Fe}_2\text{6HO}$), which, when washed, dried, and ignited, weighs 11.47 parts. The solution is miscible in all proportions with alcohol, glycerine, and water. It contains 28.7 per cent. of the salt.

Tests.—Same as for Liq. ferri sulphatis (which see). The specific gravity and sensible properties distinguish the two solutions from each other.

Uses.—For the preparation of ferri oxidum hydratum or ferric hydrate (which see).

LIQUOR HYDRARGYRI NITRATIS. Solution of Mercuric Nitrate.

A colorless solution of mercuric nitrate (Hg2NO_3), specific gravity 2.100, of strong acid reaction and caustic taste. The residue obtained

on its evaporation should be entirely dissipated when heated strongly on platinum foil. It contains about 50 per cent. of mercuric nitrate.

Tests.—*Sub-nitrates*; white or yellowish-white precipitate when largely diluted with water. *Mercurous nitrate*; more or less dark (instead of yellow) color of precipitate, with solution of potassium or sodium hydrate.

Uses.—This solution is powerfully caustic, and is used to destroy diseased tissue by its direct application. It is thus applied in treatment of chaneroid, syphilitic warts and vegetations, lupus, and acne. It is applied with a glass rod, carefully avoiding the surrounding tissue. Diluted (gtt. j. to ij. to water \bar{z} j.), it is employed as a stimulant application to ulcers of the throat and mouth, uterus and skin. Great care is required in its use, as its local application has been known to produce salivation even when but a small surface is exposed to its influence. It is a dangerous corrosive poison, and is not employed internally.

LIQUOR MAGNESII CITRATIS. Solution of Citrate of Magnesium.

A colorless solution of magnesium citrate ($\text{MgHC}_6\text{H}_5\text{O}_7$), of agreeable acidulous taste, and flavored with syrup of citric acid. (See *Acidi Citrici*.)

Preparations.—To prepare $\bar{f}\bar{z}$ xij. = gm. 360.00 of the solution, which is the amount usually dispensed.

Take of Carbonate of magnesium	.	.	.	grains 200 = gm. 13
Citric acid	.	.	.	" 400 = " 26
Syrup of citric acid	.	.	.	" 1200 = " 80
Bicarbonate of potassium	.	.	.	" 30 = " 2
Water sufficient.				

Dissolve the acid in water . grains 1800 (app. $\bar{f}\bar{z}$ iv.) = gm. 128.00

Add the carbonate of magnesia, stir until dissolved; add the syrup to a bottle of twelve fluidounces (360 gm.) capacity, and filter into it the magnesia solution. Then add the bicarbonate of potassium and water sufficient to fill the bottle, which should be corked immediately, and the stopper secured with twine. Keep the bottle inverted or on its side until wanted for use. If wanted for immediate use, shake the bottle (after securing the cork), until the bicarbonate is dissolved and the syrup fully mixed with the solution.

Uses.—Used when a saline purgative is indicated.

Dose.— \bar{z} iv. = gm. 128.00, every hour until the desired result is obtained.

LIQUOR PLUMBI SUBACETATIS. Solution of Subacetate of Lead

A colorless solution of oxyacetate of lead ($\text{Pb}_2\text{C}_2\text{H}_3\text{O}_2 \cdot \text{Pb}_2\text{HO}$), or perhaps triplumbic oxyacetate ($\text{Pb}_3\text{O}_2\text{C}_2\text{H}_3\text{O}_2$), specific gravity

1.228. It has an alkaline reaction, astringent and somewhat sweet taste, and forms opaque, white, insoluble precipitates with gum, mucilage, and vegetable albuminous substances. Its composition varies somewhat with the proportions of plumbic acetate and oxide used in its preparation, but should when having above characters contain about 25 per cent. of oxyacetate (subacetate) of lead.

Tests.—*Copper*; bluish color of filtrate from a mixture of the liquor with an excess of aqua ammoniæ. *Other salts*; residue on evaporation of filtrate from a mixture of the liquor with an excess of sulphuric acid.

Preparations.—Ceratum Plumbi Subacetatis, $\frac{N}{5}$, as follows:

Take of Solution of subacetate of lead, <i>nine parts</i>	. . .	9
Yellow wax, <i>ten parts</i>	. . . . .	10
Benzoinated lard, <i>twenty parts</i>	. . . . .	20
Olive oil, <i>four parts</i>	. . . . .	4
Liniment of camphor (see <i>Camphor</i>), <i>one part</i>	. . . . .	1

Melt the wax and lard on a water-bath, remove from heat, add the olive oil and liniment of camphor, and stir until it begins to thicken; then add the solution of subacetate of lead, stirring constantly until cold. A wooden spatula should be used. [Approx. equivalent to U. S. P.]

Liquor Plumbi Subacetatis Dilutus, $\frac{N}{40}$, as follows:

Take of Solution of subacetate of lead, <i>one part</i>	. . . . .	1
Distilled water, sufficient to make <i>forty parts</i>	. . . . .	40

Mix them. [Approx. equivalent to U. S. P., $\frac{3N}{100}$.]

Linimentum Plumbi Subacetatis, $\frac{2N}{5}$, as follows:

Take of Solution of subacetate of lead, <i>two parts</i>	. . . . .	2
Cotton-seed oil, <i>three parts</i>	. . . . .	3

Mix them. [Equivalent to U. S. P.]

Uses.—All the preparations of subacetate of lead are used for their astringent and sedative influence, to allay pain, to control inflammatory action, to constrict tissues, and diminish secretion. They have been extensively employed in the treatment of ulcers, blisters, weeping eczematous eruptions, sprains, contusions, burns, abscesses, hemorrhoids, etc. Liq. plumbi subacet. dilutus is most commonly used, and is applied as a lotion, or on soft cloths, lint, or other absorbent material, which is covered with a waterproof dressing. The liniment or cerate are similarly employed. They should be used cautiously on extensively denuded surfaces.

LIQUOR SODÆ CHLORINATÆ. Solution of Chlorinated Soda.

A clear, colorless, aqueous solution of a mixture or feeble combination of chloride and hypochlorite of sodium, in the proportion of one mole-

culc of each (NaCl , NaClO), and having the specific gravity 1.045. It has a slight odor of chlorine, a sharp, saline taste, and rapidly decolorizes solutions of indigo or other vegetable colors. It is known also as Labarraque's solution (*Liq. Sodæ Chloratæ*, U. S. P.).

Uses.—It is used as a topical stimulant and deodorizer to offensive gangrenous sores and unhealthy ulcers. It is often of marked value in scarlatina, diphtheria, gangrene of the mouth and fauces, sloughing and gangrenous wounds, and as a preventive from infection from the syphilitic virus or the poison of venomous serpents and insects.

For local use it should be diluted with 8 or 10 parts of water. Internally, its effects may be considered identical with solution of chlorine or chlorinated lime (which see).

Dose.—For internal use, *gtt. j. to xv.* = gm. 0.06 to 1.00, in water, repeated every two or three hours.

LIRIODENDRON TULIPIFERA. Tulip Tree.

The fresh bark of the young branches.

Magnoliaceæ.

Linné. Gray.

Constituents.—A peculiar principle, *liriodendrin*, crystallizing in needles, prisms, or scales, soluble in alcohol and ether, insoluble in water, and of bitter, pungent taste, is the only constituent of importance whose presence is clearly proven.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, from the recently dried bark, as in Sec. 20, Part I.

Uses.—This remedy has not received the attention it deserves. It is usually classed, rather vaguely, as a tonic, and is a stimulant to digestion, increases vascular activity, and promotes secretion by skin and kidneys. Anti-periodic properties are claimed for it, and it exerts a calmative influence in nervous disorders of hysterical origin.

Dose.—Tincture, $\frac{N}{1}$, *gtt. v. to xv.* = gm. 0.33 to 1.00, or equivalent.

LITHII BENZOAS, $\text{LiC}_7\text{H}_5\text{O}_2$. M. wt. 128. Lithium Benzoate.

The pure salt in colorless, satin-like scales, or white powder. It should be without odor, or with but slight odor of benzoin.

Solubility.—Freely soluble in water, and in alcohol (10 parts).

Tests.—Calcine a few grains of the salt, at a low, red heat, with free access of air, until the residue is white. Dissolve the residue in a few

drops of hydrochloric acid, evaporate to dryness, redissolve in a small amount of water, and filter. Test this solution as follows, using separate portions for each test: *Calcium salts*; white turbidity with solution of ammonium oxalate. *Magnesium*; white turbidity with solution of sodium carbonate. *Aluminum*; white turbidity on adding lime-water. *Metals*; precipitates on passing sulphuretted hydrogen into the solution at once or after subsequent addition of hydrochloric acid.

Uses.—Used to prevent or hasten the removal of renal or cystic deposits, caused by the presence of an excess of uric acid, which is supposed to be converted by the salt into the very soluble urate of lithium, and rapidly removed by the diuretic action of the combined lithium and benzoic acid. With this view it is administered to prevent paroxysms of gout, and in irritable states of the neck of the bladder due to the presence of insoluble uric acid or urates.

Dose.—Grs. iij. to x. = gm. 0.20 to 0.66, dissolved in water, and repeated three or four times per day.

LITHII BROMIDUM, LiBr. M. wt. 87. Bromide of Lithium.

The pure salt as a white deliquescent powder. Should be kept in well-stopped bottles.

Solubility.—Freely soluble in alcohol and water, the latter dissolving 143 parts at 0° C. (32° F.).

Uses.—In common with potassium bromide this salt depresses the reflex function of the cord through an anæsthetic influence beginning in the afferent nerves; it is therefore used to control excitement of spinal origin. It is said to act more powerfully than other bromides in epilepsy and as a hypnotic, and requires, therefore, smaller doses. It differs from the potassium salt in not appreciably affecting the heart's action.

Dose.—Grs. v. to x. = gm. 0.33 to 0.66.

LITHII CARBONAS, Li₂CO₃. M. wt. 74. Carbonate of Lithium.

The pure salt as a white inodorous powder.

Solubility.—Somewhat soluble in water (130 parts); insoluble in alcohol; readily soluble in hydrochloric acid with effervescence. The solution in hydrochloric acid, evaporated to dryness, leaves a residue entirely soluble in a mixture of equal parts of ether and alcohol, which distinguishes this chloride from those of sodium and potassium. This solution produces a crimson-colored flame when ignited.

Tests.—Prepare a neutral solution of chloride by dissolving a few grains in hydrochloric acid, evaporating to dryness, and redissolving in water. Test for magnesium, calcium, aluminium, and metals as directed under lithium benzoate. It should not turn black on heating to redness (organic impurities).

Uses.—It is claimed that the prolonged use of this salt promotes the solution and rapid excretion of gouty concretions and deposits originating from an excess of uric acids or urates. This result is due to the formation of the very soluble urate of lithium, and to the powerful diuretic influence which salts of lithium are claimed to possess.

A solvent action on false membranes is also given as a property of solution of lithium carbonate.

Dose.—Grs. j. to iij. = gm. 0.06 to 0.20, three times per day, dissolved in several ounces of water.

LITHII CITRAS, $\text{Li}_3\text{C}_6\text{H}_5\text{O}_7$. M. wt. 210. Lithium Citrate.

The pure salt, as an amorphous, deliquescent powder. It blackens when heated strongly; when its solution is mixed with a solution of calcium chloride, the mixture filtered and heated, a white precipitate forms (citrate of calcium).

Solubility.—Soluble in water ($5\frac{1}{2}$ parts).

Tests.—Calcine until a white residue remains; dissolve in hydrochloric acid, evaporate to dryness, and test as follows: *Sodium and potassium chlorides*; insoluble residue on treatment with a mixture of alcohol and ether, equal parts. *Magnesium, calcium, aluminium, and metallic impurities*; dissolve in water, and test as under lithium benzoas.

Uses.—The properties and uses of this salt may be considered as identical with those of lithium carbonate, but is considered preferable on account of its greater solubility.

Dose.—Same as carbonate of lithia.

LITHOSPERMUM OFFICINALE. Common Gromwell.

The root and seeds.

Borraginaceæ.

Linné.

Constituents.—These have not been determined.

Preparations.—From both root and seeds.

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—These are not well defined. The root has been successfully

used in acute and chronic cystitis, and is said to be beneficial in calculous affections.

The root has usually been given in infusion; the seeds in substance powdered (grs. x. to xxx. = gm. 0.66 to 2.00).

The tinctures may be used in equivalent amounts. A native species, *L. latifolium* (Michaux), probably has similar properties, and may be prepared in tincture for trial, according to Secs. 42 and 45, Part I.

L. canescens, or hoary puceon, is said to possess similar properties, and has been employed as a local application (in form of ointment, made by boiling the fresh roots with lard or butter) to phagedenic ulcers, foul wounds, old sores, etc.

LOBELIA INFLATA. Lobelia.

The fresh leaves and tops.

The ripe seeds.

Lobeliaceæ.

Linné. Gray. Bentley and Trimen.

Constituents.—An alkaloid, *lobelina*, and an acid, *lobelic acid*, which are probably combined in the drug; *resin*, *wax*, and *gum* are found in the herb. The seeds contain a larger proportion of the active medicinal constituents than the herb, and about 30 per cent. of fixed oil in addition. *Lobelina* is liquid, of yellow color, aromatic odor, acrid taste, soluble in alcohol, ether, and, to a less extent, in water. It is altered by exposure to a boiling temperature, or by long exposure to the air. Its salts are more permanent, soluble in water, and those with the mineral acids are crystallizable. *Lobelic acid* is crystallizable and soluble in alcohol, water, and ether.

An acrid principle, *lobelacrin*, has been described; it is considered by some observers as *lobelate* of *lobelina*.

Preparations.—From the leaves and tops:

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A vinegar, $\frac{N}{10}$, from the recently dried leaves and tops, as in Sec. 14, Part I.

[Tinct. Lobelia, U. S. P., is of strength $\frac{N}{5}$, and Acetum Lobeliæ, U. S. P., $\frac{N}{10}$.]

From the ripe seeds:

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

An oleo-resin, $\frac{4N}{1}$, with alcohol, as in Sec. 25, Part I.

Uses.—*Lobelia* is a vital stimulant of great power, when properly used. In small doses, it increases arterial pressure, acting as a vaso-

motor stimulant, and, through the sympathetic nervous system, increases the activity of all vegetative processes. Thus employed, it is a useful remedy in conditions characterized by vascular enfeeblement, fulness and want of elasticity in tissue, oppression of respiration with sense of weakness in the epigastrium, and feeble, inelastic pulse. As the dose is increased, it acts as an irritant to the motor nervous system, especially the medulla oblongata, and by its influence through the pneumogastric and its nucleus, causes vomiting, and a sense of suffocation in the chest. When this influence is prolonged, or the dose is largely increased, profound motor exhaustion results, with extreme muscular relaxation and sense of impending dissolution.

In appreciable, or sometimes quite large doses, lobelia is of great value in respiratory and cardiac neuroses, characterized by spasm, as in angina pectoris, neuralgia of the heart, spasm of the bronchi in asthmatic attacks, uncomplicated whooping-cough, spasmodic laryngitis, etc.

This antispasmodic influence is also very useful in obstinate convulsions, especially those of hysterical origin, in rigidity of the os uteri, vagina, or perineum, etc. This influence can be best obtained by doses of gtt. j. to iij. = gm. 0.06 to 0.20 of tincture, $\frac{N}{i}$, repeated every fifteen minutes, until nausea results; then decreasing the dose and lengthening the interval.

Dose.—Hb. Lobelia Inf., *Tincture*, $\frac{N}{i}$, gtt. i. to \mathfrak{z} i. = gm. 0.06 to 4.00, or equivalent.

Sem. Lobelia Inf., in half above doses.

LOLIUM TEMULENTUM. Bearded Darnel.

The grain or fruit (caryopsis).

Graminaceæ.

Linné. Bentley and Trimen.

Constituents.—The poisonous principle of this plant is not clearly identified, being ascribed by different observers to *acrid fixed oil*, to an *amorphous glucoside* of yellow color, to an *acid body*, and to an *oily compound*. *Starch*, *gum*, *sugar*, *albumen*, *gluten*, and salts are also present.

Uses.—Accidental poisoning has resulted from this drug, which is indigenous to European grain fields and waysides. This has occurred by mixture of the substance with flour made from grain with which it grew. Medicinally the drug has been but little used. It is claimed that it is of value to antagonize over-distention of the cerebral vessels, characterized by headache, epistaxis, giddiness, ringing in the ears, somnolency, dilated pupils, etc. In its poisonous effects it resembles both aconite and belladonna. It is worth careful study.

Dose.—Gr. j. = gm. 0.06, every four or six hours, in pill or in powder.

LYCOPODIUM CLAVATUM. Club Moss.

The sporules.

Lycopodiaceæ.

Linné. Bentley and Trimen.

Constituents.—Small amounts of *volatile alkaloids*, a considerable amount (47 per cent.) of a *bland oil*, *sugar*, *gum*, and *saline matters*, containing alumina and phosphoric acid.

Preparations.—A trituration, as in Sec. 49, Part I.

A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I., from the sporules triturated in a mortar until a doughy mass forms.

Uses.—It is used most extensively as a protection to tender or irritable conditions of the skin, as in *inترcrigo*, *herpes*, etc. It is claimed by homœopathic authorities that, although apparently inert in the crude state, when prepared by trituration or in tincture after rupture of the sporules by trituration, it is a remedy of value in many diseases of the gastro-intestinal, urinary, and respiratory mucous membranes and skin. It seems to act as a stimulant to the vegetative or sympathetic nervous system, and to prove valuable in cases of depraved functional activity of the organs under its control. It is said to be indicated in certain derangements of digestion, with loss of appetite, flatulence, acidity, constipation, in chronic catarrh, pneumonia, early stages of phthisis pulmonalis following bronchial catarrh; also in urinary incontinence, vesical catarrh, and painful urination.

The presence of "red sand" (uric acid gravel) in the urine, is said to be characteristic in cases where it will prove curative. The remedy deserves attention.

Dose.—Tincture, $\frac{N}{5}$, gtt. j. to x. = gm. 0.06 to 0.66, to water \bar{z} iv. = gm. 128.00. Teaspoonful doses (gm. 4.00) or in triturations.

LYCOPUS VIRGINICUS. Bugleweed.

The fresh herb in flower.

Labiatæ, Satureiæ.

Linné. Gray.

Constituents.—*Resin*, *volatile oil*, a *bitter principle*, and *tannin* are present, though the drug has not been carefully analyzed.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This remedy has been classed as a sedative with *digitalis*, *veratrum vir.*, *aconite*, and *gelseminum*. A careful study of its in-

fluence indicates that the resemblance ceases with the fact that similar results are sometimes obtained as with the remedies named. The apparent sedation of the heart's action is probably due to its influence through the sympathetic nervous system, in removing capillary vascular engorgement and obstruction to the circulation, and not a direct action on the central organ. This obstruction may be manifested, in chronic diseases, by a frequent feeble pulse, often intermittent, with irregular, rapid, and labored action of the heart on rapid motion, the skin being blanched and extremities cold. The passive capillary congestion may involve all the viscera, including the lungs (causing a tendency to spitting of blood), the kidneys (causing profuse urination with sugar sometimes present), the liver (causing various bilious symptoms), and the mucous surfaces generally (causing mucous catarrhal conditions). In some cases, where the pulse is hard, jerky, and quick, with indications of incipient inflammation in some one of the viscera, this remedy will prove useful, reducing the force and frequency of the heart's motion by removal of the vascular obstruction, and (when in the lungs) quieting cough by removing the cause of irritation. It has been used successfully in functional heart diseases, hæmoptysis, incipient phthisis, diabetes, and menstrual derangement, with a tendency to puffiness or swelling of the limbs on exertion, when the pulse was as described above.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent.

LYTHRUM SALICARIA. Loosestrife.

The fresh herb in flower.

Lythraceæ.

Linné.

Constituents.—No analysis is recorded, but *tannin* and *mucilage* are evidently the most prominent constituents.

Uses.—It is a feeble agent, but is a popular North European remedy for dysentery and diarrhœa, and locally in catarrhal conditions of mucous membranes. It is usually used in decoction.

Dose.— $\mathfrak{z}\text{j}$. = gm. 4.00, in decoction, $\frac{N}{10}$ (Sec. 18, Part I.).

MAGNESIA, MgO. M. wt. 40. Magnesium Oxide. Calcined Magnesia.

Heavy magnesia (magnesia calcinata ponderosa) of commerce, prepared from heavy carbonate of magnesia free from impurities. It is a white powder of a slightly earthy taste, odorless, and of alkaline reac-

tion. Magnesia, U. S. P., is light magnesia, more bulky, but of same composition.

Solubility.—Mixed with water, the hydrate ($Mg2HO$) forms, and is soluble to a slight extent (5000 parts). Insoluble in alkaline solutions. Soluble in acids without effervescence.

Tests.—*Hydration*; loss of weight in excess of five per cent. on heating to redness. *Carbonate*; effervescence on solution in dilute acids. *Calcium, barium, or strontium oxides*; imperfect solubility in diluted sulphuric acid. *Metallic impurities*; dark coloration on adding hydrosulphuric acid to a solution of magnesia in a dilute acid, or after such addition followed by excess of ammonium hydrate. *Zinc oxide*; white precipitate on adding (to a solution in acid) hydrosulphuric acid and excess of ammonium hydrate. *Calcium*; white precipitate from filtrate from previous test on adding solution of ammonium oxalate. Impurities from the carbonate used in the preparation of the oxide may be detected as under carbonate of magnesium.

Uses.—Magnesia is employed to neutralize excessive gastric acidity or to antidote acids and other poisons, when taken in dangerous quantities. Its combinations with the gastric acid being soluble, produces a laxative effect. If given in large doses, and especially on an empty stomach, it increases the secretion of acid, forming a soluble salt in sufficient amount to purge. When used to neutralize excessive acid already present, it should be given after meals in but small amounts, when it may produce a gentle laxative effect. If a purgative effect is wanted, larger doses must be given, preferably some time before meals. When uric acid is present in the urine, simultaneously with undue gastric acidity, magnesia is an appropriate and useful remedy, promoting alkalinity of the urine and elimination of the acid. It antidotes phosphorus and arsenic, given in large doses diffused in water.

Dose.—For gastric acidity, grs. j. to xv. = gm. 0.06 to 1.00, suspended in water, or milk, and given after meals.

As a purgative, grs. iij. to 5j. = gm. 0.20 to 4.00, suspended in water, preferably before meals. The small dose for nurslings.

MAGNESII CARBONAS, $3MgCO_3, Mg2HO.3H_2O$. M. wt. 364.

Magnesium Carbonate. Carbonate of Magnesium.

Heavy carbonate of magnesia (*magnesia carbonas ponderosa*), of commerce, in square cakes. It is white, inodorous, of earthy taste, readily pulverized, and presenting under the microscope a granular appearance, without trace of prismatic crystals. Calcined at a red heat,

100 parts yield a residue of 43 parts of magnesium oxide (MgO). *Magnesium carbonas*, U. S. P., is the light variety of carbonate, but has identical properties.

Solubility.—Nearly insoluble in water (2500 parts), freely soluble in dilute acids, carbonic acid-gas being given off, and clear solutions resulting.

Tests.—Mix with water and add sulphuric acid, drop by drop, until solution is effected and test as follows: *Silica*; slight turbidity in above solution. *Manganese*; reddish precipitate on adding excess of solution of ammonium carbonate. *Iron*; greenish turbidity from preceding test. *Zinc, aluminum, or phosphates*; white precipitate from same test. *Lime*; white precipitate on adding ammonium oxalate solution to solution of carbonate in acid neutralized by ammonium hydrate. *Chlorides*; white precipitate on adding solution of silver nitrate to solution of the carbonate in nitric acid. *Sulphates*; white precipitate on adding solution of barium nitrate to same.

Uses.—These are practically identical with those of the oxide, which see.

Dose.—Twice that of the oxide.

MAGNESII SULPHAS, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$. M. wt. 246.

Magnesium Sulphate. Sulphate of Magnesium.

The pure salt in colorless, transparent, inodorous, rhombic prisms or acicular needles.

100 parts dissolved in boiling water, and mixed with an excess of hot solution of sodium carbonate, yield a precipitate, which, when washed, dried, and calcined at a red heat, weighs when cool 16.26 parts (MgO). It contains 51.22 per cent. of combined water.

Solubility.—Soluble in cold (3 parts) and hot water (1 part); insoluble in alcohol, but soluble in dilute alcohol.

Tests.—*Zinc*; white precipitate on addition of solution of ammonium sulphhydrate to an aqueous solution of the salt. *Other metals*; dark precipitates from same reagent. *Calcium sulphate*; white turbidity in diluted solution on addition of solution of ammonium oxalate. *Ammonium sulphate*; odor of ammonia gas on boiling its solution with liquor potassæ. *Sodium sulphate*; alkaline reaction with litmus paper, of filtrate from a well-boiled mixture of the magnesium sulphate, barium carbonate, and water.

Uses.—Magnesium sulphate is used to procure the evacuation of the intestinal canal in cases of simple constipation, or those accompanied

by mental hebetude, irritability, and dull headache, seemingly dependent on reabsorption of excrementitious matters, and in febrile disorders, which are apparently aggravated by the existence of the same conditions. The salt acts purgatively without intestinal irritation, by retaining the water already present, and not by increasing the secretion of the mucous glands, or attracting water into the intestines from the blood, except when given in very concentrated solution. In short, it purges by simple liquefaction of the contents of the intestinal canal by the water administered, which is retained by the salt dissolved in it. Small doses largely diluted are preferable to the ordinary large purgative doses usually given.

Dose.—For constipation, \mathfrak{zj} . = gm. 4.00, dissolved in a gobletful of water or plain soda water (carbonic acid water), before breakfast.

For brisk purgation, $\mathfrak{z}\text{iv}$. to $\mathfrak{z}\text{j}$. = gm. 16.00 to 32.00, dissolved in a half pint of water, gm. 250.

MAGNESII SULPHIS, $\text{MgSO}_3 \cdot 6\text{H}_2\text{O}$. M. wt. 212.

Magnesium Sulphite.

The pure salt in transparent, prismatic crystals, which readily absorb oxygen from the air, and must be kept in well-stoppered bottles.

Solubility.—Freely soluble in water (20 parts); insoluble in alcohol.

Tests.—*Sulphate*; white precipitate, on adding to a solution of the salt in water acidulated with nitric acid a solution of barium nitrate.

Uses.—These are but limited. It has been proposed as an antiseptic in typhoid diseases, when the dark-red color and dark fur on the tongue and offensive odor of breath indicate the septic process.

Dose.—Grs. x. to xxx. = gm. 0.66 to 2.00, every three or four hours, given in solution.

MAGNOLIA ACUMINATA. Cucumber Tree.

The recent bark.

The fresh fruit, collected just before the opening of the ovaries.

MAGNOLIA GLAUCA. Swamp Sassafras.

The recent bark.

The fresh fruit, collected just before the opening of the ovaries.

MAGNOLIA GRANDIFLORA. Great Magnolia.

The recent bark.

The fresh fruit, collected just before the opening of the ovaries.

MAGNOLIA UMBRELLA. Umbrella Tree.

The recent bark (*M. Tripetala*. Lin.).

The fresh fruit, collected just before the opening of the ovaries.

Magnoliaceæ.

Linné. Gray.

Constituents.—There is a close resemblance among all of the above species. As regards their proximate constituents, all have not been examined with care. The bark of *M. glauca* contains *volatile oil*, a tasteless *crystalline principle*, a *bitter principle*, and *tannin*. The bark of *M. grandiflora* contains *resin*, *volatile oil*, and a *crystalline principle*. The fruit, and probably the bark, of *M. umbrella* contains pungent *resin*, *volatile oil*, and crystalline *magnolol*, soluble in alcohol, insoluble in water.

Preparations.—From the bark of each species:

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

From the fruit of each species:

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—These are not well defined, but deserve investigation. All the species seem to possess similar properties, but individual study may develop important differences.

They all possess an aromatic, somewhat bitter taste; and when taken internally increase vascular tension, promote the functions of the skin and mucous surfaces, and exert a tonic influence in states of debility.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to 3j. = gm. 0.33 to 4.00, or equivalent.

MALTUM. Barley Malt.

Pure malt of commerce prepared from barley (*Hordeum*).

Gramineæ, *Hordeaceæ*.

Linné.

Constituents.—Malt contains *starch*, *sugar*, *dextrine*, and *diastase*, a peculiar ferment formed from the protein matter of the barley during the malting process, and which converts starch into sugar when an infusion of the malt is kept for some time at about 70° C. (158° F.). *Phosphates of lime* and *magnesia* are also present.

Preparations.—An extract as follows:

Take of Coarsely-ground malt, <i>one part</i>	1
Water, <i>five parts</i>	5

Mix in a suitable vessel, and digest, with frequent stirring, for four hours in a water-bath whose temperature is carefully maintained at 55°

C. (131° F.). Express strongly, strain the liquid, and evaporate, with constant stirring, to the consistence of thick honey by means of a water-bath or vacuum apparatus, and at a temperature not exceeding 55° C. (131° F.).

Uses.—Malt is used in disease almost exclusively in the form of the extract. Extract of malt is more properly an aliment than a medicine. Its saccharine matter is the result of the conversion of the starch into malt sugar, or glucose, through the agency of the diastase, during the preparation of the extract, or in the process of malting the grain.

This sugar is ready for immediate absorption as food; and the diastase serves to convert into the same substance other starchy foods taken at meals. It is a useful agent in cases in which there is impaired power of digestion and assimilation of starchy foods, such as often exists in chronic diseases. It is used as a vehicle for many other medicines, often with questionable propriety.

Dose.— $\overline{3j}$. to $\overline{3ss}$. = gm. 4.00 to 16.00, three times per day, in milk or water.

MANGANII OXIDUM NIGRUM, MnO_2 . M. wt. 87. Manganese Dioxide. Black Oxide of Manganese.

The mineral pyrolusite in compact, brownish-black, earthy masses, or crystalline masses of a fibrous or acicular structure, black color, and metallic lustre, and containing at least 60 per cent. of manganese dioxide. When pure, the specific gravity of pyrolusite is 4.9.

Solubility.—Insoluble in water; soluble with decomposition in acids.

Tests.—*Less than 60 per cent. of oxide*; blue precipitate when solution of potassium ferri-decyanide is added to a solution obtained by mixing 10 grains of the oxide to be tested with 40 grains of pure granular ferrous sulphate dissolved in 2 drachms of water, and then adding 1 fluidrachm of concentrated hydrochloric acid, digesting in a warm place, with occasional gentle agitation, for several hours, adding a few drops more of acid, heating the mixture to boiling, filtering, and diluting the filtrate with water.

Uses.—Black oxide of manganese has been used medicinally in analogous cases to those in which iron is employed. Homœopathic physicians use it in triturations in affections of the bones, periosteum, chronic suppurative affections of the skin when slow to heal, and in chlorotic conditions when gastric disturbances are prominent. It may be prepared for use by trituration as in Sec. 49, Part I.

Used also as a source of chlorine for the preparation of oxygen and the salts of manganium.

Dose.—Grs. j. to x. = gm. 0.06 to 0.66, or in trituration.

MANGANII SULPHAS, $\text{MnSO}_4 \cdot 4\text{H}_2\text{O}$. M. wt. 223. **Manganous Sulphate. Sulphate of Manganese.**

The pure salt in pale, rose-colored, right rhombic, prismatic crystals, which slightly effloresce in dry air.

Solubility.—Freely soluble in cold, somewhat less in boiling water; insoluble in alcohol.

Tests.—*Ferrous sulphate*; blue precipitate from a diluted solution of the salt acidulated with hydrochloric acid on addition of solution of ferridcyanide of potassium. *Cupric sulphate*; black precipitate with sulphuretted hydrogen from a similar solution. *Magnesium sulphate*; white precipitate with sodium phosphate from filtrate obtained by adding sulphhydrate of ammonium in excess to a dilute solution of the salt and filtering. *Sodium, or potassium salts*; fixed residue from filtrate after precipitation with sulphhydrate of ammonium on evaporation to dryness, and heating to redness.

Uses.—This salt has been recommended in doses of grs. ij. to v. = gm. 0.13 to 0.33, as a purgative producing large discharges of bile. It has also been associated with iron, under the supposition that the influence of that agent was thereby increased. Recent investigations throw doubt on these statements, and indicate that the salt requires careful study before it can be safely or usefully prescribed.

MANNA. Manna.

The saccharine exudation of *Fraxinus ornus*, in flakes of a cheesy consistence, yellowish-white color and faint odor.

Oleaceæ.

Linné. Bentley and Trimen.

Constituents.—*Mannit* ($\text{C}_6\text{H}_{14}\text{O}_6$) forms from 60 to 90 per cent. of manna. It is freely soluble in cold and hot water, also in dilute alcohol, and in 90 parts of alcohol, 67 per cent., but is insoluble in ether. An acrid *resin* of reddish color, and soluble in ether, a *fermentable sugar* which reduces cupric oxide, a *crystallizable sugar* and *mucilage* are also present.

Uses.—Used as a mild laxative, suitable for infants and young children, or as an addition to other purgatives.

Dose.—3j. to 3ij. = gm. 4.00 to 8.00 for children. Dissolve in hot water.

MARRUBIUM VULGARE. Horehound.

The fresh leaves and tops.

Labiatae, Stachydeæ.

Linné. Gray. Bentley and Trimen.

Constituents.—A peculiar principle, *marrubiin*, bitter, acrid, crystallizable, soluble in alcohol and ether, slightly soluble in cold water, *resin*, *tannin*, and *volatile oil* in small amount, are the constituents of interest.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Marrubium is an energetic stimulant to the mucous membranes, especially influencing the laryngeal and bronchial surfaces, though in large doses it sometimes proves laxative. It has been chiefly employed for its effects on the pulmonary surfaces and those of the air-passages, though it is said to influence the respiratory function through a direct action on the pneumogastric. Although an old remedy, it needs careful study.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

MARUTA COTULA. Mayweed.

The fresh plant in flower (*Anthemis Cotula*. Linné).

Compositæ, Anthemideæ.

De Condolle. Gray.

Constituents.—*Volatile oil*, acrid *resin*, *valerianic* and *oxalic* acids, with a bitter principle, are said to be present. An alkaloid, *anthemidina*, and a bitter acid, *anthemidic* acid, are also announced, but their existence has not been verified.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug has not received the careful study it deserves. It exerts a direct influence on the skin and urinary tract, and affects the nervous system in a manner similar to chamomile (*matricaria*). It has proven useful in chronic weakness of the sphincter vesicæ, with involuntary loss of urine.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent, to water \mathfrak{z} iv. = gm. 128.00. Teaspoonful doses of the mixture (gm. 4.00).

MASTICHE. Mastic.

The concrete resinous exudation from the *Pistacia lentiscus*, Linné, in globular or tear-shaped fragments of the size of a pea, of a pale-yellow color, transparent, brittle when broken at ordinary temperatures,

softening readily in boiling water, having an aromatic odor and turpentine-like taste, and of specific gravity of 1.07.

Anacardiaceæ.

Linné. Bentley and Trimen.

Constituents.—*Volatile oil* in minute amount, a saponifiable *resin*, *masticic acid* ($C_{20}H_{30}O_2$), or alpha resin, soluble in alcohol; a white tenacious substance insoluble in alcohol, and called *masticin* ($C_{20}H_{31}O_2$), or beta resin, soluble in ether and turpentine. *Mastiche* is soluble, with but slight residue, in volatile oils, acetone, benzol, creasote, and warm benzine.

Uses.—A solution of mastic in turpentine, called mastic varnish, is in common use. An alcoholic solution is also used as a cement and varnish. It was formerly much employed to check excessive discharges from the mucous surfaces of the bronchia, genito-urinary and intestinal tracts. Cotton saturated with the alcoholic solution serves a good purpose as a temporary filling for cavities in decayed teeth.

MATICO. Matico.

The leaves of *Artanthe elongata*, *Miquel*, or *Piper angustifolium* of Ruiz et Pavon.

Piperaceæ.

Bentley and Trimen.

Constituents.—*Volatile oil* in small amount ($1\frac{1}{2}$ per cent.), which is thick and of a yellowish-green color; an acrid *resin* of a ruby color, *artanthic acid*, which is crystallizable, and *tannin*, constitute the important principles present. A bitter principle called *maticine* has been given as a constituent, but its identity has not been clearly established. All the constituents dissolve in alcohol.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

[Tinctura Matico, U. S. P. = $\frac{N}{16}$.]

Uses.—This remedy, whether taken internally or used locally, exerts a direct influence on the capillary vessels. In appropriate cases and doses, it controls hemorrhages and mucous fluxes, and increases somewhat arterial pressure and the elimination of urine. These properties make it a useful remedy in catarrhal conditions of the genito-urinary organs, mucous or hemorrhagic fluxes of the gastro-intestinal tract, and in bronchitis and hemorrhages from the lungs. It may also be used topically, more or less diluted, as a hæmostatic.

Dose.—Tincture, $\frac{N}{4}$, gtt. v. to 5j. = gm. 0.33 to 4.00.

MATRICARIA CHAMOMILLA. German Chamomile.

The flowers.

Compositæ, Senecionidææ.

Linné. Bentley and Trimen.

Constituents.—*Volatile oil*, composed of a terpene ($C_{10}H_{16}$), associated with an *oxidized substance* ($C_{10}H_{18}O$), and having a strong odor, blue color, warm, aromatic taste, soluble in alcohol, and of specific gravity 0.93; *bitter extractive, tannin, malates*, and some principles common to all plants are present.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Matricaria is the source of the homœopathic tincture of chamomilla, and is made from the fresh plant in flower.

Uses.—Used in similar conditions and doses as *Anthemis nobilis*, which see.

MEL. Honey.

The saccharine matter deposited in the honeycomb by *Apis mellifica*, Linné. [Insecta, Hymenoptera.]

MEL DESPUMATUM. Clarified Honey.

Honey clarified as follows:

Take of Honey, a convenient quantity q. s.

Melt in a deep, narrow vessel by means of a water-bath, remove from the source of heat, and pour carefully a shallow layer of cold water upon the surface of the melted honey; let stand until a tough scum, composed of wax and other impurities, rises to the surface; pour off the water, remove the scum, and strain through flannel.

Constituents.—Honey should be of a specific gravity 1.35 to 1.42. It contains a minute amount of *volatile oil*, associated with yellow coloring matter, *grape sugar*, or dextrose ($C_6H_{12}O_6 \cdot H_2O$), which causes right-handed rotation of the ray of polarized light, and *lævulose* ($C_6H_{12}O_6$), giving left-handed rotations of the same. A little *wax* and *gummy matters* are present in the crude honey.

Tests.—*Insoluble matters*; insoluble residue on treating with diluted alcohol. *Starch*; blue color of residue from proceeding, when heated, to boiling with a little water, and addition of solution of iodine. *Artificial grape sugar*; white precipitate with solution of barium nitrate or chloride, when added to the honey dissolved in distilled water. (Sulphuric acid used in making the grape sugar, and present as sulphate of calcium.)

Uses.—Clarified honey is used as a vehicle for other medicines, (Mellita or medicated honeys, or when acetic acid is added, oxymellita or oxymels), as an excipient for pill masses or confections; alone, or associated with other substances, as a stimulant to mucous surfaces of the mouth and throat when relaxed, or when aphthæ, thrush, etc., are present.

Borax, potassium chlorate, and sulphurous or muriatic acids, etc., are sometimes associated with it.

MELILOTUS OFFICINALIS. Melilot.

The recently dried blossoms.

Leguminosæ, Papilionaceæ.

Willdenow.

Constituents.—*Coumarin* ($C_9H_6O_2$), an odorous principle which is crystalline, soluble in hot water, alcohol, fixed and volatile oils, with *melilotic acid* ($C_9H_{10}O_3$) and *coumaric acid* ($C_9H_8O_3$), both of which are bitter and crystallizable, are all the constituents of interest.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—A useful remedy in capillary congestions, and the various motor and sensory disturbances caused by that condition. This condition is indicated by throbbing, fulness, oppression, epistaxis, and headache, when affecting the head; hacking, tickling cough, fulness of the throat or chest, soreness and pleuritic pains, and smothering sensations, when the respiratory tract is involved; cramps, fulness, heaviness, pain or tenderness at the stomach, in the rectum (piles), or ovaries, when the capillaries of these regions are congested; and in the cramps, colics, and neuralgias due to a similar condition of the spinal or other nerve-centres.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, to water, \bar{z} iv. = gm. 128.00. Teaspoonful (gm. 4.00) every hour if required.

MELISSA OFFICINALIS. Lemon Balm.

The fresh leaves and tops.

Labiatae, Satureiæ.

Linné. Gray.

Constituents.—The constituent of most interest is the *volatile oil*, which is colorless, soluble in alcohol, and has a specific gravity of 0.89. *Resin*, *tannin*, and a *bitter substance* are also present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45 Part I.

Uses.—This substance mildly stimulates the activity of the cutaneous exhalants, increases arterial pressure, promotes the menstrual flow, and antagonizes the spasmodic tendency in hysteria and nervous derangements of an allied character.

Dose.—Tincture, $\frac{x}{i}$, gtt. xxx. to 3j. = gm. 2.00 to 4.00, or equivalent in warm water.

An infusion may be given ad libitum.

MENISPERMUM CANADENSE. Yellow Parilla.

The recent root.

Menispermaceæ.

Linné. Gray's Genera.

Constituents.—This drug contains *two alkaloids*, one of which is *berberina*, the other being white, soluble in alcohol and ether, and capable of neutralizing acids completely. Whether other constituents of medicinal interest exist, has not been determined.

Preparations.—A tincture, $\frac{x}{i}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{x}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—This drug is usually classed, rather obscurely, as alterative, but doubtless owes whatever virtues it possesses to its power of promoting the digestion and assimilation of food. It is a useful remedy in relaxed and catarrhal states of the gastro-intestinal tract, such as are due to abuse of mercurials, drastic purgatives, or exist in scrofulous and syphilitic affections. It has some reputation in diseases of the skin. It deserves more careful study.

Dose.—Tincture, $\frac{x}{i}$, gtt. x. to 3j. = gm. 0.66 to 4.00, or equivalent.

MENTHA PIPERITA. Peppermint.

The fresh leaves and tops.

Labiatae, Satureiæ.

Linné. Bentley and Trimen.

Constituents.—The important medicinal constituent is the essential oil, *Ol. Menthæ piperitæ*, which has a hot taste, peculiar pungent odor, greenish color, and is soluble in alcohol of 80 per cent. (3 parts). It contains a camphor-like body, menthene ($C_{10}H_{20}O$), which forms white, acicular crystals, soluble in alcohol and ether, insoluble in water, and separates when the oil is cooled to a low temperature. Another body, isomeric with menthol, and which is liquid at all temperatures, is associated with mint camphor. The oil has a specific gravity, usually near .92, and a boiling point of 185° C. (365° F.). When adulterated with castor-oil or turpentine it is less soluble in alcohol (80 per cent.), and

in case turpentine is used is acted on with considerable violence on addition of iodine, which simply thickens the pure oil.

Preparations.—From the herb:

A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

The oil distilled with water from the fresh herb.

From the oil:

A tincture, $\frac{N}{100}$, with alcohol, as in Sec. 46, Part I. [U. S. P.]

A medicated water, $\frac{N}{300}$, as in Sec. 15, *a*, Part I. [U. S. P.]

Uses.—Peppermint is a useful agent for the relief of the abdominal and gastric pains accompanying flatulence, cholera morbus, diarrhœa, etc., and the nervous phenomena, palpitation, etc., caused by difficult digestion. The oil applied locally over the course of a painful nerve will often give material relief in neuralgic headaches and rheumatic affections, and is also used locally for toothache with prompt results.

Dose.—Tincture, $\frac{N}{I}$, gtt. x. to \mathfrak{z} j. = gm. 0.66 to 4.00, or equivalent.

Oil menth. pip., gtt. j. to iij. = gm. 0.06 to 0.20, or equivalent.

Menth. pip. *Aqua*, $\frac{N}{500}$, \mathfrak{z} ss. = gm. 16.00.

MENTHA VIRIDIS. Spearmint.

The fresh leaves and tops.

Labiatae, Satureiæ.

Linné. Bentley and Trimen.

Constituents.—The volatile oil, *Ol. Menthæ viridis*, is the constituent of medicinal importance. It is composed of an oxygenated body ($C_{10}H_{14}O$), to which its odor is due, and which is associated with a light hydrocarbon ($C_{10}H_{16}$). Its color, specific gravity, and reactions with iodine are said to be identical with *Ol. menth. pip.*, which sec. Its boiling point is $160^{\circ} C.$ ($320^{\circ} F.$). It is freely soluble in alcohol, 80 per cent. (3 parts), when fresh. It differs from *Ol. menth. pip.* in taste and odor, though there is some resemblance.

Preparations.—From the herb:

A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

The oil distilled with water from the fresh herb.

From the oil:

A tincture, $\frac{N}{100}$, with alcohol, as in Sec. 46, Part I. [U. S. P.]

A medicated water, $\frac{N}{300}$, as in Sec. 15, *a*, Part I. [U. S. P.]

Uses.—*Mentha viridis* possesses similar virtues to *M. piperita*, but is less powerful. It is also quite a certain diuretic in suppression of urine of children.

Dose.—Menth. vir. *Tinct.*, $\frac{N}{1}$, gtt. v. to 5j. = gm. 0.33 to 4.00, or equivalent.

Ol. menth. vir., gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

MENYANTHES TRIFOLIATA. Buckbean.

The fresh plant in flower.

Gentianaceæ.

Linné. Bentley and Trimen.

Constituents.—A bitter glueoside, *menyanthin* ($C_{33}H_{54}O_{16}$), soluble in alcohol and alkalies, slightly so in water, and insoluble in ether, is the constituent of most interest. It is separated as an amorphous, fusible, whitish mass of very bitter taste, and which readily splits up into sugar, resin, and a volatile oily substance, *menyanthol*, when boiled with dilute acids. *Tannin* is present in small amount.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—These are not well defined. In common with many other bitter drugs, it is used in atonic dyspepsia, dependent on a relaxed and catarrhal condition of the gastro-duodenal surfaces. It promotes elimination by the kidneys, and seems to exert a favorable influence in chronic cutaneous diseases. It should be more carefully studied.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to 5ss. = gm. 0.33 to 2.00, or equivalent.

MESEMBRYANTHEMUM CRYSTALLINUM. Ice Plant.

The fresh plant.

Mesembryanthemæ.

Linné.

Constituents.—No principle of peculiar interest has been discovered in this plant. Salts of sodium, potassium, and the earths, oxalic acid, albumen, and the ordinary constituents of plants are found in it.

Uses.—The expressed juice has been employed in cystic disorders with painful urging or incontinence, but with questionable advantage.

Dose.—Of the juice, a teaspoonful (5j. = gm. 4.00), every three hours.

Of the infusion, $\frac{N}{10}$, in doses of 5ij. = gm. 64.00.

MESENNA. Musenna.

An Abyssinian bark, the exact source of which is not settled, being considered by some (Martius, Hoekstetter, and others) as the bark of *Rottlera Schimper* (Euphorbiaceæ), by others (Brogniart) as that of *Albizzia anthelmintica* (Papilionaceæ).

Constituents.—A peculiar principle, *musennin*, which resembles saponin, is acrid, amorphous, and soluble in alcohol, is the constituent of interest.

Uses.—Musenna is an Abyssinian remedy for tænia, which was introduced into Europe, but has not been extensively used.

Dose.—The drug is administered in powder mixed with honey in doses of $\bar{3}$ ij. to $\bar{3}$ iv. = gm. 64.00 to 128.00, after a preliminary fast of 24 hours. A purgative is given a few hours after the musenna.

METHYLENI BICHLORIDUM, CH_2Cl_2 . M. wt. 85. Bichloride of Methylene. Methylene or Methene Dichloride.

The pure methylene bichloride as a colorless, neutral liquid, of specific gravity 1.344 at 18° C. (64.4° F.), and boiling at 30.5° C. (87° F.). It has a sweetish, chloroform-like odor, is volatile, and its vapor is readily combustible.

Solubility.—Freely soluble in alcohol and ether.

Tests.—*Chloroform*; specific gravity. When ether is added, its odor will be apparent. A mixture of chloroform and alcohol will be detected by the separation of the alcohol by adding water and taking the specific gravity of the heavy liquid, which will be found to exceed that of methene dichloride.

Uses.—This is one of the many liquids proposed as an anæsthetic, and is claimed to have been administered by Mr. Spencer Wells in “more than one thousand operations of a nature unusually severe as tests of an anæsthetic,” and “proved to be, without a single exception, applicable to every patient, perfectly certain to produce complete anæsthesia, relieving the surgeon from all alarm and even anxiety, and its use has never been followed by any dangerous symptoms which could be fairly attributed to it.” Notwithstanding this strong testimony, its use is not exempt from danger, as according to Dr. Richardson, “it belongs to a dangerous family of chemical substances, and cannot, therefore, be played with without risk.” Several deaths are reported as caused by it, but whether directly attributable to the drug, or occurring under the use of a substituted mixture or impure article, does not appear clear.

It deserves careful investigation with a pure article. It should be used with a plentiful admixture of air, and in amount not exceeding 40 minims (gm. 2.66) for the first inhalation, smaller amounts being used to prolong its effects.

METHYLI IODIDUM, CH₃I. M. wt. 142. Iodide of Methyl.

The pure iodide of methyl as a colorless liquid, specific gravity 2.199 at 0° C. (32° F.), and boiling at 43.8° C. (111° F.). It has an ethereal odor, and is combustible with difficulty.

Uses.—This substance is anæsthetic when pure, but is too dangerous for use by inhalation, especially as it is quite liable to become decomposed. It is occasionally employed as a local anæsthetic to control severe pain, as of cancer, etc.

MEZEREUM. Mezereum.

The bark of *Daphne mezereum*. *Linné.*

Thymelacæ.

Bentley and Trimen.

Constituents.—A *volatile, acrid principle*, an acrid, *soft resin*, soluble in alcohol, and a *bitter glucoside, daphnin* (C₃₁H₃₄O₁₉.4H₂O), soluble in alcohol and water, insoluble in ether, are the constituents of interest. The volatile principle has not been carefully investigated.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

An ointment, $\frac{N}{5}$, as follows:

Take of Mezereum tincture, $\frac{N}{I}$, one part	1
Unguentum paraffini, five parts	5

Heat together on a water-bath until the alcohol has evaporated, add of paraffine ointment sufficient to restore the weight to *five (5) parts*. Stir until cool. (Equivalent to U. S. P. ointment.)

Uses.—This drug is irritant to the mucous surfaces of the alimentary canal, causing, in large doses, nausea, vomiting, copious secretion, and even gastro-enteritis. It also influences the renal surfaces and skin in a manner somewhat analogous to cantharides, though with less intensity. Smaller doses are absorbed, and increase secretion of mucous, cutaneous, and other glands. Violent pain, sometimes of a pressive character, but usually sticking, transient, or flying, and worse at night, characterize the conditions in which this remedy has proved useful in minute doses. Low grades of inflammation, as of the periosteum with bone pains, neuralgias worse at night, and when the pain is as described above, are cases in which the remedy is applicable. It has been locally applied as an irritant to promote the discharge from suppurating surfaces, usually in ointment.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent, to water \mathfrak{z} iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

MIKANIA GUACO. Guaco.

The dried leaves.

Compositæ, Eupatoriæ.

Willdenow.

Constituents.—These have not been determined.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—This remedy is reputed to possess a direct influence on the skin and mucous surfaces, controlling local inflammations and congestions. It is employed in diarrhœa and cholera infantum, but is especially of value in erysipelas, whether of the smooth or vesicular variety. It is used internally; and locally in tincture largely diluted and applied on cloths.

Used in the same manner it also antagonizes the poison of rhus. It deserves careful study.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent. Dilute with water for local use.

MITCHELLA REPENS. Partridge-berry Vine.

The fresh plant.

Rubiaceæ, Cinchonæ.

Linné. Gray.

Constituents.—No analysis of this drug has been published. *Tannin*, a *volatile oil*, and a *bitter principle* are probably present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This drug has been credited with powers which properly belong to others with which it is usually associated, and its real value is, therefore, not well defined. It seems to act as a stimulant to the pelvic circulation, and, therefore, is useful in renal and cystic disorders, with scanty secretion of urine containing much mucous sediment. In irritable conditions of the gravid uterus, or in menstrual disorders depending on derangement of the vascular supply of the pelvic organs, it often proves curative.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

MONARDA PUNCTATA. Horsemint.

The fresh leaves and flowering tops.

Labiataæ, Monardææ.

Linné. Bentley and Trimen.

Constituents.—The volatile oil, *Oleum Monardæ*, is the only constituent

of interest. It is yellow, yellowish-red, or reddish color, freely soluble in alcohol, of peculiar odor and pungent taste. It is composed of a volatile portion, (elæopten,) and a stearopten, the latter being thymol, $C_{10}H_{14}O$ (see *Thymus*). The oil dissolves iodine without violent reaction, and changes to a red, afterward black color.

Preparations.—The volatile oil, distilled with water, from the fresh plant.

From the herb:

A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

From the oil:

A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 46, Part I.

Uses.—Monarda is a vascular stimulant, increasing the functional activity of the skin, kidneys, and mucous surfaces of the gastro-intestinal canal. It is useful in irritable conditions of the renal and cystic surfaces, as in strangury, suppression, and gravel, when given in minute doses. Diarrhœas, intestinal and other catarrhs come within its curative scope, and it relieves the griping, colicky pains accompanying these conditions. It is often curative in malarial poisoning, and is worthy of further study in this direction. The oil is a valuable local application to relieve pain in neuralgia and rheumatism. Thymol, one of its constituents, is powerfully antiseptic, and locally, anæsthetic, paralyzing the end organs of sensory nerves.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

Ol. monardæ, gtt. j. to ij. = gm. 0.06 to 0.13, or equivalent.

MONATROPA UNIFLORA. Indian Pipe.

The fresh plant.

Ericaceæ.

Constituents.—These have not been determined.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug deserves more careful investigation than it has received. The expressed juice is an excellent remedy for local use in conjunctivitis. It may be preserved by the addition of an equal bulk of glycerine. Internally, it exerts a decided controlling influence over convulsions of children or of the puerperal state.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent to water $\tilde{\text{z}}$ iv. = gm. 128.00. Teaspoonful every fifteen minutes if required.

MONESIA. Monesia.

The commercial extract of the bark of *Chrysophyllum glyciphloeum* in irregular, friable, dark-brown fragments.

Sapotaceæ. Casaretti, *Jour. de Pharm. et Chem.*, t. vi., 1844.

Constituents.—*Tannin*, *monesin*, which is acrid and probably identical with saponin, *red coloring matter*, similar to that of catechu, traces of a *volatile, aromatic substance*, *glycyrrhizin*, *fat*, *wax*, *gum*, *chlorophylle*, *pectin*, *lignin*, and *salts*.

Preparations.—A tincture, $\frac{N}{10}$, with diluted alcohol, as in Sec. 46, Part I.

A glycerite, $\frac{N}{5}$, as in Sec. 22, Part I.

Uses.—Monesia is a remedy introduced from Brazil, where it is employed as a stimulant astringent for all chronic mucous catarrhs, as of the bronchia, gastro-intestinal canal, urethra, or vagina. Also in pulmonary and uterine hemorrhages, epistaxis (locally), and as a topical application to ulcers and exudations of the mucous surfaces, and in fissure of the anus.

It is used both internally and locally.

Dose.—Grs. j. to xv. = gm. 0.06 to 1.00, or equivalent.

The glycerite for local use.

MORPHIA, $C_{17}H_{19}NO_3 \cdot H_2O$. M. wt. 303. Morphia or Morphine.

The pure alkaloid in colorless, transparent, prismatic crystals of small size, or in white crystalline powder.

Solubility.—Soluble in boiling (30 parts) or cold alcohol (50 parts), chloroform (175 parts), glycerine (220 parts), and in dilute acids and fixed alkaline hydrates. Insoluble in cold water, ether, amylic alcohol, benzol, and ammonium hydrate.

Tests.—*Mineral impurities*; insolubility in boiling alcohol, or residue after complete incineration on platinum foil. *Narcotia or codei*; residue on evaporation of a little ether, which has been agitated with some of the morphia, or incomplete solubility in solution of potassium hydrate.

Uses.—For the preparation of the salts of morphia, being rarely used otherwise.

The medical uses of the salts of morphia are in general similar to those of opium, for which it is often substituted. It differs from that drug in that it is more likely to excite nausea and vomiting, and, given by mouth, it does not diminish to the same degree secretion from

mucous surfaces, though its hypodermic use usually causes constipation. If given to produce sleep, the disagreeable after effects of morphia are more marked than from opium. Its influence in causing diaphoresis and itching of the skin is more powerful than that of opium, and is often distressing. It is superior to opium for the relief of spasm, as of traumatic tetanus, spasmodic asthma, and angina pectoris; in these cases it is usually administered by hypodermic injection. The especial sphere of morphia salts is, however, the relief of pain, as of the neuralgiæ, though it is admissible, when necessary, in all cases when the pulse is soft and the tongue moist. If given by mouth, about three times the amount will be required that is needed for hypodermic use. The acetate is the most desirable of the salts for the latter purpose. In administering for the relief of pain, a small dose should be given at first, repeated, and increased if necessary, until the amount is determined that is required to allay the pain without producing contraction of the pupil. The dose should only be repeated as the pain returns. This method will prevent much of the subsequent suffering from nausea, vomiting, constipation, headache, etc.

For remedial employment of minute (homœopathic) doses, see *Opium*.

Dose.—The average dose of the salts of morphia is $\frac{1}{6}$ of a grain (gm. 0.011) for internal use, or $\frac{1}{16}$ to $\frac{1}{8}$ gr. (gm. 0.004 to 0.008), hypodermically, repeated as above directed.

MORPHIÆ ACETAS, $C_{17}H_{19}NO_3, C_2H_4O_2.H_2O$. M. wt. 363.

Acetate of Morphia.

The pure salt in white powder of bitter taste and slight odor of acetic acid. Soluble without color in strong sulphuric acid and containing 83.5 per cent. of morphia ($C_{17}H_{19}NO_3.H_2O$).

Tests.—*Narcotina*; turbidity on adding solution of tannic acid, which clears up on adding diluted sulphuric acid. *Other alkaloids*; transient turbidity, not disappearing on addition of slight excess of solution of potassium hydrate. *Fixed impurities*; residue on complete incineration on platinum foil.

Uses.—See *Morphia*.

MORPHIÆ HYDROCHLORAS, $C_{17}H_{19}NO_3, HCl.3H_2O$. M. wt. 375.5.

Hydrochlorate or Muriate of Morphia.

The pure salt in white, acicular, silky crystals of bitter taste, and containing 80.7 per cent. of morphia ($C_{17}H_{19}NO_3.H_2O$).

Solubility.—Soluble in water (20 parts), alcohol (60 parts), and glycerine (9 parts); insoluble in ether.

Tests.—*Salicin and other bitter organic substances*; change of color, when a little of the salt is warmed with a mixture of two parts of sulphuric acid and one of water. Other impurities, see *Morphiæ Acetas*.

Uses.—See *Morphia*.

MORPHIÆ SULPHAS, $(C_{17}H_{19}NO_3)_2H_2SO_4 \cdot 5H_2O$. M. wt. 758.
Sulphate of *Morphia*.

The pure salt in transparent, feathery, needle-shaped crystals, containing 79.94 per cent. of morphia $(C_{17}H_{19}NO_3 \cdot H_2O)$.

Solubility.—Soluble freely in water (2 parts), glycerine (5 parts), and alcohol; insoluble in ether and chloroform.

Tests.—*Fixed impurities*; residue after complete ignition on platinum foil. *Other impurities*; see tests under *Morphia Acetas*, and *Hydrochloras*. *Quinia sulphas*; imperfect solubility and emerald-green color when dissolved in chlorine water.

Preparations.—A solution, *Liquor Morphiæ sulphatis*, $\frac{N}{500}$, as follows:

Take of Sulphate of morphia, one part	.	.	.	.	.	1
Distilled water, sufficient for five hundred parts	.	.	.	.	.	500

Dissolve.

Uses.—See *Morphia*.

MOSCHUS. Musk.

The dried secretion from the preputial follicles of *Moschus moschiferus*, *Linné*, commercially known as Chinese musk.

Mammalia, Ruminantia.

Constituents.—*Fat, wax, gelatinous and albuminous substances, cholesterin*, and a volatile odorous principle, which is probably a decomposition product of the constituents, due to the presence of moisture.

Preparations.—A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 47, Part I.

[*Tinctura moschi*, U. S. P. = $\frac{N}{10}$.]

Triturations as in Sec. 49, Part I.

Uses.—Musk is chiefly used for its direct influence on the cerebro-spinal centres in disorders characterized by incoördinate or exaggerated motor phenomena, and for its stimulant effect on the vascular system when the pulse is weak, surface cool, and chilliness, tremor, and subsultus are present. Eruptive diseases, typhus and typhoid, the spasmodic phenomena of hysteria, chorea, tetanus, pertussis, constriction

of the larynx and hiccough, present conditions in which it may be indicated.

Dose.—Tincture, $\frac{N}{10}$, gtt. j. to x. = gm. 0.06 to 0.66 to water $\bar{\text{z}}$ iv. Teaspoonful (gm. 4.00) doses every two hours.

The triturations, $\frac{N}{10}$ to $\frac{N}{100}$, are the most convenient, as cases in which it is useful require but minute doses.

MYRICA CERIFERA. Bayberry.

The fresh bark.

The waxy substance obtained from the berries, and known as bayberry tallow.

Myricaceæ.

Linné. Gray.

Constituents.—Two *resins*, both soluble in alcohol, one acrid and soluble in ether, the other, astringent and insoluble in ether; a small amount of *volatile oil*; *myronic acid*, soluble in alcohol, insoluble in ether, of acrid taste, frothing with water, and probably a noncrystallizable glucoside. These are the medicinal constituents of the bark.

The wax contains palmitic acid, palmitin, and lauric acid. It is about four-fifths soluble in alcohol.

Preparations.—From the bark:

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used for its stimulant influence on mucous membranes in catarrhal disorders of long standing, characterized by peculiar tenacious discharge, which is often offensive and irritating. It is thus employed with benefit in chronic nasal, bronchial, gastric and intestinal catarrhs, leucorrhœa, and in jaundice caused by the extension of a duodenal catarrh into the hepatic duct. Irritable conditions of the mucous surfaces are also favorably influenced by the drug, if associated with remedies to control general vascular excitement, and used in minute doses. Its local use as a wash, spray, or gargle, is worth remembering in disorders of the mouth or throat.

The wax forms a good basis for a stimulant ointment for indolent ulcers, etc.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

MYRICA GALE. Sweet Gale.

The fresh seed vessels collected when full grown.

Myricaceæ.

Linné. Gray.

Constituents.—A thick volatile oil containing a large amount of

stearopten, *fragrant resin*, and a *bitter principle* are present, but have not been studied.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—These are not well defined, but its popular use as an internal and local remedy in skin diseases will suggest the direction of inquiry to such as desire to test it to determine its true scope.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, and locally diluted.

MYRISTICA FRAGRANS. Nutmeg Tree.

The kernel of the seed, *Semen Myristicæ*. (*Myristica*—Nutmeg, U. S. P.)

The arillus or envelope of the nut-like seed. *Arillus Myristicæ*. (*Macis*—Mace. U. S. P.)

Myristicææ.

Houttuyn. Bentley and Trimen.

Constituents.—Nutmegs contain a volatile oil, *Oleum Myristicæ* (U. S. P.), which is composed of a hydrocarbon, myristicene ($C_{10}H_{16}$), with the odor of nutmeg and an oxygenated body, myristicol ($C_{10}H_{14}O$). Volatile oil of nutmeg is pale-yellow or colorless, limpid, of specific gravity .92 to .95, warm taste, and aromatic odor. It is freely soluble in alcohol, and boils at $160^{\circ} C.$ ($320^{\circ} F.$). Nutmegs also contain 25 to 30 per cent. of fat, known as *Oleum Myristicæ Expressum*, or expressed oil of nutmeg. This oil, sometimes incorrectly called oil of mace (see below), contains about 6 per cent. of the volatile oil above described, and fat with brown coloring matter, both soluble in cold alcohol, the remainder being fatty matter, soluble in boiling alcohol and ether. The latter substance is called myristin ($C_3H_5O_3 \cdot 3C_{14}H_{27}O_2$), and fuses at $31^{\circ} C.$ ($87.8^{\circ} F.$). The solid fat, soluble in cold alcohol, is myristic acid, fusible at $53.8^{\circ} C.$ ($128.8^{\circ} F.$). This substance is sometimes deposited from the volatile oil on standing, and has been called nutmeg camphor and myristicin. The expressed oil is solid, brown in color, bland taste, fragrant odor, specific gravity .995, and is soluble in warm ether and boiling alcohol. *Starch* and *nitrogenous compounds* are also present in nutmegs.

Mace contains a volatile oil, *Oleum Macidis*, which contains a volatile hydrocarbon, macene ($C_{10}H_{16}$), probably identical with myristicene of oil of nutmeg, and an oxygenated portion not well understood. Mace also contains *red fat*, soluble, and *yellow fat*, insoluble in alcohol. Resin and resinified oil are reported by one observer, instead of the fats mentioned; also uncrystallizable *sugar* and a *starch-like* body.

Uses.—Both nutmegs and mace are used as condiments and flavors for soups and pastry. They are somewhat employed as flavors for medicinal compounds, and are added either in substance or in the forms of solutions of their volatile oils.

Spiritus Myristicæ, U. S. P., is a tincture, $\frac{3N}{100}$, of the oil in alcohol. *Tinctura Macidis*, $\frac{N}{5}$, with alcohol, is sometimes used.

These substances are carminative, somewhat astringent, and in large doses narcotic, and have been usefully employed in diarrhœa, dysentery, and to relieve nausea.

The expressed oil of nutmeg is occasionally used in rheumatism and paralysis, locally applied alone or as a basis for a stimulating ointment.

Dose.—Grs. v. to xv. = gm. 0.33 to 1.00, or its volatile oil, gtt. ij. to v. = gm. 0.13 to 0.33, or equivalent. Nutmeg and mace in similar doses.

MYRRHA. Myrrh.

The gum resinous exudation from *Balsamodendron Myrrha*. *Nees.*
Burseraceæ. Berg. Bentley and Trimen.

Constituents.—Gum myrrh is a mixture of *gum* (40 to 50 per cent.) with *resin* (30 to 40 per cent.), and *volatile oil* (2 to $2\frac{1}{2}$ per cent.); the last two soluble in alcohol, ether, and chloroform. The oil is yellow in color, changing by age and exposure, and of specific gravity 0.98. Its composition varies with its age, but is probably when pure $C_{10}H_{14}O$.

Preparations.—A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I.

A trituration, $\frac{N}{10}$, as in Sec. 49, Part I.

[*Tinctura Myrrhæ*, U. S. P. = $\frac{N}{5}$.]

Uses.—Used in enfeebled conditions of the system characterized by muscular atony, vascular enfeeblement, and profuse secretion from mucous membranes when inflammatory symptoms are absent. These conditions may be present in gastric and intestinal disorders, bronchial and pulmonary catarrhs, or those of the mucous membranes of the nasal passages and throat, discharges from the genito-urinary surfaces, menstrual derangements, with laxness and debility of muscular fibre (as in amenorrhœa, chlorosis, etc.). Locally it is a useful stimulant to unhealthy ulcers of skin or mucous membranes.

Dose.—Trituration, $\frac{N}{10}$, gr. j. to x. = gm. 0.06 to 0.66, or equivalent of tincture, $\frac{N}{5}$, well diluted or in emulsion.

MYRTUS COMMUNIS. Myrtle.

The fresh leaves and twigs, when the shrub is in flower.

Myrtaceæ.

Linné.

Constituents.—A volatile hydrocarbon ($C_{10}H_{16}$), specific gravity .891, and of a greenish-yellow color, is the constituent of most interest.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—When *M. communis* is taken internally, the oil is excreted by the skin and surfaces of the genito-urinary organs and bronchia. In the latter cases it acts as a stimulant, and reduces secretion in catarrhal affections of the parts. Through its influence on the skin, it checks colliquative sweating, and is said to be useful in many chronic eruptions, especially when used locally as well as internally. Locally, it stimulates suppurating ulcers and wounds, destroys fetor, and corrects excessive secretion, vascular engorgement, and relaxation of mucous membranes; it thus proves useful in leucorrhœa, prolapsus, hemorrhoids, and dysentery, as an injection, and as a wash in pharyngitis, conjunctivitis, etc.

According to homœopathic authorities, it is curative of a peculiar symptom of some pulmonary disorders, described as a “stitch in the left breast running to the shoulder-blade.”

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. .06 to 0.66, or equivalent.

Locally, diluted (1 in 10).

NAPHTHALINUM, $C_{10}H_8$. M. wt. 128. Naphthalin.

The pure hydrocarbon in colorless, transparent plates, fusing at 79° C. (174.6° F.).

Solubility.—Soluble in hot alcohol, fixed and volatile oils, chloroform, ether, and carbon bisulphide; insoluble in water.

Preparations.—A tincture, $\frac{N}{10}$, with alcohol, as in Sec. 46, Part I.

An ointment, $\frac{N}{10}$, with Ungt. paraffini, as in Sec. 50, Part I.

Uses.—This substance has been used to a limited extent to promote expectoration by its stimulant action on the bronchial mucous membranes, in cases of chronic bronchitis, bronchorrhœa, and pertussis. Externally, in solution, it resembles camphor in its action, and is similarly employed. In ointment, it serves a good purpose in the treatment of cutaneous diseases of a scaly character.

Dose.—Tincture, $\frac{N}{10}$, gtt. v. to xxx. = gm. 0.33 to 2.00, in some aromatic alcoholic liquid, such as simple elixir, brandy, or wine.

NARCISSUS PSEUDONARCISSUS. Daffodil.

The fresh flowers of the wild plant.

Amaryllidaceæ.

Linné.

Constituents.—An *alkaloid*, said to resemble in its physiological action that of atropia, has been extracted from the flowering bulbs of this species of *Narcissus*, but has not been sufficiently studied to determine its true medicinal value. The bitter and acrid principles have not been examined.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—These are not clearly defined. The recently dried flowers are promptly emetic in doses of 15 to 20 grs. = gm. 1.00 to 2.00, given in decoction. The drug is also irritant to the intestinal surfaces, especially in large doses. It possesses a marked influence on the nervous system, which has been utilized in pertussis, epilepsy, chorea, and hysteria, to control spasmodic action. The drug is well deserving of study in the directions indicated.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

NASTURTIIUM OFFICINALE. Water Cress.

The fresh herb in flower.

Cruciferæ. Siliquosæ.

R. Brown.

Constituents.—A *volatile oil*, probably identical with that of mustard, is the active constituent.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 41, Part I.

Uses.—This drug increases excretion by skin, kidneys, and bowels, and is a valuable glandular stimulant in scrofulous disorders. It serves good purpose when an “alterative” influence is desired for the purpose of eliminating impurities from the organism. It may be eaten fresh as a salad or given as below.

Dose.—Tincture, $\frac{N}{2}$, gtt. xv. to 3j. = gm. 1.00 to 4.00, in milk, wine, or syrup.

NECTANDRA RODIÆI. Bebeeru.

The bark.

Lauracæ.

Schomburgh. Bentley and Trimen.

Constituents.—The constituent of interest is *beberina* ($C_{18}H_{21}NO_3$), which, when pure, is white, uncrystallizable, soluble in alcohol and ether, and fusible at a moderate temperature without decomposition. *Tannin* is also present, and probably other alkaloids not as yet clearly identified.

Uses.—Bebeeru is employed exclusively for the preparation of Beberia sulphas (which see).

NIGELLA SATIVA. Nutmeg Flower.

The ripe seeds.

NIGELLA DAMASCENA. Fennel Flower.

The ripe seeds.

Ranunculaceæ, Helleboreæ.

Linné.

Constituents.—Both species of *Nigella* contain a *volatile oil*, upon which chiefly depends its medicinal value. An uncrystallizable *bitter substance* is also present. Neither principle has been carefully examined. The seeds contain $33\frac{1}{3}$ to 35 per cent. of *fixed oil*, of an orange color, which is solid at 20° C. (36.5° F.).

Preparations.—From both species:

A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I.

Uses.—The drugs are employed in Syria and southern Europe as condiments, of agreeable spicy flavor, and medicinally to allay griping pains, to promote the menstrual flow, and as stimulants to secretion by the kidneys and bronchial mucous surfaces.

Dose.—Tincture, $\frac{N}{5}$, gtt. x. to xv. = gm. 0.66 to 1.00.

NITROBENZOLUM, $C_6H_5NO_2$. M. wt. 123. Nitrobenzol.

An oily liquid, of a somewhat yellow color, sweet taste, and odor of bitter almonds. Its specific gravity is 1.209, and at 3° C. (37.4° F.) it forms acicular crystals.

Solubility.—Soluble in all proportions in ether and alcohol, and freely in sulphuric and nitric acids when concentrated.

Uses.—Under the names of oil or essence of mirbane and artificial oil of bitter almonds, nitrobenzol is used for scenting soaps and in various perfumes, but its most important use is in preparing anilina.

It has been employed as a local remedy in parasitic skin diseases, but as it is intensely poisonous, and accidents have occurred from its use, it is too unsafe to be recommended.

Its poisonous effects should be combated with stimulants, ammonia, friction, electricity, etc.

NITROGENII MONOXIDUM, N_2O . M. wt. 44. Nitrous Oxide.

The pure oxide as a colorless gas of slight odor, sweetish taste, and specific gravity 1.6. It may be purchased in commerce condensed by aid of pressure and cold into a thin, colorless, mobile liquid, confined in wrought-iron vessels.

Solubility.—Nitrous oxide is soluble in alcohol, ether, water, fixed and volatile oils.

Uses.—As an anæsthetic, suitable for brief operations, nitrous oxide, or laughing-gas, as it is called from its exhilarating primary action, is well established in favor. It is principally employed when teeth are to be extracted, though it is suitable for other operations requiring but a few moments for their performance.

It should be inhaled through a tube with a mouth-piece arranged with valves for the escape of expired air. Suitable gas-holders and inhalers are furnished by dealers in dentist's supplies.

NITROGLYCERINUM, $C_3H_5(NO_2)_3O_3$. M. wt. 227.

Nitroglycerine. Glonoin.

The chemical trinitroglycerine as a colorless, oily liquid, of specific gravity 1.60 at 15° C. (59° F.). Heated by percussion, or in closed containers, it explodes with destructive violence, and should therefore be kept only in solution for medicinal use.

Solubility.—Soluble in ether, alcohol, and methylic alcohol; insoluble in water.

Preparations.—A tincture, $\frac{N}{100}$, as follows:

Take of Nitroglycerine, <i>one part</i>	.	.	.	.	.	.	1
Alcohol, <i>ninety-nine parts</i>	.	.	.	.	.	.	99

Mix.

Uses.—This powerful drug directly influences the medulla oblongata, the functions of the pneumogastric and vaso-motor nerves, especially of the cerebrum. Minute doses cause contraction of the cerebral arteries, and change the rate of the pulse and respiration. This influence is useful in headaches of a congestive character, with throbbing of carotid and temporal arteries, and feeling of fullness and pressure in the head, worse from jarring, stooping, or from heat, as of the sun. Doses ranging from gtt. j. to x. = gm. 0.06 to 0.66 of the tincture, $\frac{N}{100}$, produce congestive phenomena as above characterized and are sometimes employed to antagonize spasmodic nervous phenomena due to anæmia of the brain, as in epilepsy, spasmodic asthma, and, according to some, angina pectoris. The remedy is claimed to resemble amyl nitrite in its action in these diseases, and that its influence is more permanent, though less prompt.

Dose.—In congestive conditions of the brain, add gtt. j. = gm. 0.06 of the tincture, $\frac{N}{100}$, to water \mathfrak{z} iv. = gm. 128.00, and give a teaspoonful of the mixture (gm. 4.00).

In spasmodic disorders as above.

NUPHAR ADVENA. Yellow Pond Lily.

The fresh plant (*N. lutea*, *Willdenow*).

Nymphaeaceæ.

Aitkin. Gray.

Constituents.—These have not been examined.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This drug, it is claimed, directly influences the lower portion of the digestive canal, especially the rectum, producing liquid stools of a yellow color. It is also said to depress the generative function. Homœopathic authors claim for it curative power in case of enterocolitis, with aggravation in the morning, the stools being yellow, fetid, but painless, or nearly so; also in spermatorrhœa from atony of sexual organs. It is used in the 2^x or 3^x dilution. The drug should be further studied.

Dose.—Mix tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66 with water \bar{z} iv. = gm. 128.00. Teaspoonful doses (gm. 4.00) of mixture.

NUX VOMICA. Nux Vomica.

The seeds of *Strychnos Nux vomica*.

Loganiaceæ.

Linné. Bentley and Trimen.

Constituents.—Nux vomica contains three alkaloids, all of which are bitter and poisonous, viz., *strychnia* ($C_{21}H_{22}N_2O_2$), which is described later in this work (see *Strychnia*); *brucia* ($C_{23}H_{26}N_2O_4$), which crystallizes with $4H_2O$ from boiling alcohol, is soluble to a slight degree only in water (850 parts), more freely in glycerine (70 parts), readily in chloroform (7 parts), in alcohol (1.5 parts), insoluble in ether; *igosuria*, whose constitution is as yet unsettled, and which is claimed by one observer (Schützenberger) to be a mixture of nine different alkaloids. A tannin-like body, *igosuric acid*, with *fat*, *resin*, *gum*, and *sugar*, are also present.

Preparations.—From the finely powdered seeds:

An extract, $\frac{10N}{1}$, with alcohol, as in Sec. 19, Part I.

Note.—If the drug yields less than 10 per cent. of its weight in extract, add sugar of milk to make up the deficit.

A dried extract, $\frac{4N}{1}$, with alcohol, 8 parts, water, 2 parts, as in Sec. 20, Part I.

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

(Tincture N. vom., U. S. P., is approximately of the strength $\frac{N}{5}$,

but is made by solution of 2 per cent. of the extract in alcohol 8, water 1.)

Uses.—The usefulness of nux is most marked in condition characterized by relaxation or flaccidity of the muscular elements of organs and tissues dependent on impairment of spinal and sympathetic innervation. This condition in liver, spleen, or portal circle, causes passive congestion of these parts, with such symptoms as fulness or tenderness in the hepatic region, pain in the right shoulder, yellow color of eyes, and coating on tongue, nausea, sallow complexion, indigestion, diarrhœa and dysentery with nausea, umbilical pain, and yellowness of skin. Nux benefits in these disorders only in absence of irritation or active determination of blood. Paralysis, complete or partial, when presenting the symptoms of visceral derangement above given, comes within the curative scope of this remedy; but if inflammation, any symptom of structural lesions of the cord or rigidity of the muscles exist with the paralysis, it should not be used. In asthenic conditions of typhoid and other diseases, when from impairment of innervation due to anæmia of the nerve centres, and characterized by incoördinate muscular tremor, enfeeblement in the power of the respiratory muscles, laxity or paresis of sphincters of bladder and anus, nux is beneficial as a stimulant to the cord.

Homœopathic writers recommend it in conditions the opposite of the above described, *i. e.*, exaggerated motor phenomena, such as tetanus, spasms preceded by violent shuddering, trismus alternated with opisthotonos, convulsions with muscular rigidity, etc. While it is possible that the minute doses (homœopathic potencies of 6^x to 30^x) may, through a stimulant influence on the vaso-motor centres, relieve the hyperæmia of the cord that must be present to cause such symptoms, other remedies will prove more reliable and safe in severe cases. Cases of tetanus, especially chronic ones of spontaneous origin, have recovered under use of doses of nux or strychnia, which would be unsafe under ordinary circumstances. This result is doubtless due to the rapid exhaustion of the motor nerves, thus preventing death from spasm of the respiratory muscles rather than from any relief to the congested nerve centres, and is at best of questionable propriety or safety.

Dose.—Tincture, $\frac{N}{2}$, gtt. ss. to v. = gm. 0.03 to 0.33, or equivalent, for its stimulant influence on the nerve centres.

NYMPHÆA ODORATA. White Pond Lily.

The fresh root.

Nymphæaceæ.

Aitkin. Gray.

Constituents.—A *bitter* and an *acid principle*, not as yet isolated, *tannin*, and *mucilage*, are the principal constituents.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This drug directly influences the mucous surfaces of the throat and air-passages, the gastro-intestinal and genito-urinary tracts, and in conditions characterized by excessive secretion of mucus or muco-pus, or in ulceration with acid and offensive discharges, is a useful remedy; when possible, it should be employed both locally and internally. The tincture may be mixed with hot water for local use as an injection, wash, or gargle. Obstinate acid leucorrhœas, with or without ulceration, diarrhœa and dysentery, aphthous and putrid ulcerative sore throat, chronic, offensive ulcers, bronchorrhœa, etc., are diseases in which it is indicated.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

CENOTHERA BIENNIS. Evening Primrose.

The fresh plant in flower.

Onagraceæ.

Linné. Gray.

Constituents.—No satisfactory analysis of the plant has been published.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This remedy is useful in gastric irritation and the asthmatic breathing, pulmonary oppression, and palpitation of the heart caused by the reflex relation through the pneumogastric and its branches, of the parts involved. Painful digestion, vomiting of food, and pointed but not coated tongue, characterize the cases in which it is indicated.

It has also been employed in diarrhœa, and locally to infantile eruptions. It requires further study in these directions.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to 3ss. = gm. 0.66 to 2.00.

OLEANDER. Oleander.

The fresh leaves, gathered when the plant is in flower (of *Nerium oleander*).

Apocynaceæ.

Linné.

Constituents.—Two alkaloids, *pseudo-curaria*, which is inodorous, tasteless, of green color, soluble in water and alcohol, insoluble in ether, and *oleandria*, a yellow, bitter, and poisonous resinous body, soluble in alcohol and ether, slightly soluble in water; with *tannin*, *fat*, and

principles common to all plants are the constituents given, but the drug requires more careful investigation.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug has received but little attention outside of homœopathic practice. Employed by that method, it is occasionally useful in irritable conditions of the digestive organs with functional impairment, characterized by vomiting of food and sour, bilious matters, ravenous hunger, sinking sensation, and pulsation in the pit of the stomach, rumbling and flatulence, diarrhœa of undigested food, vertigo and obscuration of sight coming on suddenly when walking. It has also been used for eczematous or other eruptions of a vesicular, humid, or scaly character, biting and itching as if from vermin, especially when located on the back of the head and behind the ears. The drug should be investigated.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent, to water $\tilde{\text{z}}$ iv. Teaspoonful doses (gm. 4.00).

OLEUM AMYGDALÆ AMARÆ. Oil of Bitter Almonds.

The oil produced by the decomposition of the amygdalin of bitter almond cake (after expression of the fixed oil), through the agency of emulsin in the presence of water, with which it is distilled; when pure it is chemically benzaldehyd (C_7H_6O), but as found in commerce it contains about 13 per cent. of anhydrous hydrocyanic acid, which forms at the same time as the oil, and distils with it. Oil of bitter almond is colorless or light yellow, of specific gravity 1.04 to 1.065, of burning taste, odor suggesting hydrocyanic acid, and is intensely poisonous.

Solubility.—Freely soluble in ether, chloroform, alcohol, carbon bisulphide, and oils; somewhat soluble in water.

Tests.—*Chloroform and alcohol*; distil about two drachms from a test tube heated by a water-bath, and with another test tube connected with it by a bent tube and kept cool in a glass of ice water; mix the distillate with aqueous solution of iodine; chloroform will separate with a rose color from the dissolved iodine. Decant the aqueous solution and add liquor potass. q. s. to decolorize; if alcohol be present a precipitate, iodoform, will form, and can be recognized under the microscope. *Nitrobenzol*; red color, changing to green on agitation of two parts of the oil with one part of fused potassium hydrate. *Other essential oils*; imperfect solution when added drop by drop with agitation to a strong aqueous solution of sodium bisulphite.

Preparations.—A medicated water, $\frac{N}{1000}$, from the oil, as in Sec. 15, Part I., making 1000 parts of the water from each one part of oil (U. S. P.).

Uses.—These are identical with dilute hydrocyanic acid (which see), but it is much stronger (6 to 1), and should therefore be used with the greatest caution. The medicated water (Aq. Amygdalæ am.) is a convenient form for use.

Dose.—Ol. Amygd. am., gtt. $\frac{1}{4}$ to j. = gm. 0.016 to 0.06.

OLEUM AMYGDALÆ EXPRESSUM. Almond Oil.

The colorless or slightly yellow-colored oil, expressed from either sweet or bitter almonds. It is bland, inodorous, of specific gravity 0.917 to 0.920, and is composed mainly of olein, with a small amount of palmitin.

Solubility.—It is soluble in benzol, carbon bisulphide, volatile oils, ether, and in absolute alcohol.

Tests.—*Other oils*; decided change of color on mixing well with an equal bulk of 25 per cent. nitric acid.

Uses.—Used as a constituent of some simple bland ointments (with wax, etc.) as a demulcent, and as a laxative for infants. (See *Amygdala dulcis*.)

OLEUM CAJUPUTI. Oil of Cajeput.

The oil distilled from the leaves of *Melaleuca Cajuputi*.

Myrtaceæ.

Roxburgh. Bentley and Trimen.

Constituents.—Oil of cajeput is considered a hydrate of the hydrocarbon cajeputine ($C_{10}H_{16}$), and to have therefore the composition ($C_{10}H_{16} \cdot H_2O$).

The oil is of green color, which is occasionally due to copper, though often to chlorophylle. Its specific gravity is from .914 to .930; it is neutral, of warm camphor-like taste, and boils at 113° C. (343.4° F.).

Solubility.—It is freely soluble in alcohol, ether, and oils.

Tests.—*Copper*; reddish-brown precipitate or color on addition of ferrocyanide of potassium to some dilute hydrochloric acid that has been shaken with the oil. *Oil of turpentine and other oils*; decreased solubility in alcohol, increased violence of reaction on adding iodine, and difference in odor from the pure oil.

Preparations.—A tincture, $\frac{N}{10}$, from the oil, with alcohol, as in Sec. 46, Part I.

Uses.—Used as a diffusible stimulant and antispasmodic in cholera,

cholera morbus, flatulent colic, and hysteria; also to control vomiting, hiccough, and dyspnœa of nervous origin. Locally, it is often efficacious in diseases of the skin of a scaly character, and used with friction as a rubefacient in rheumatic and paralytic states of the muscles, and local neuralgiæ.

For internal use, the tincture or oil may be added to tinctures, ether, spirits of chloroform, or dropped upon sugar. For local use, mix with olive or cotton-seed oil, or by trituration with ungt. paraffini. Applied upon cotton, it often relieves toothache, earache, and even deafness.

Dose.—Of the oil, gtt. ij. to x. = gm. 0.13 to 0.66, or equivalent of the tincture, $\frac{x}{10}$.

OLEUM MORRHUÆ. Cod-liver Oil.

The fixed oil obtained from the livers of *Gadus Morrhua* and other species of *Gadus*; of specific gravity .92 to .925, light-yellow color, very slight acid reaction, and little odor.

Class Pisces, Order Telostia, Family Gadida.

Constituents.—The glyceride *olein* is the principal constituent, though small and varying quantities of *stearin* and *palmitin* are also present. Iodine, bromine, sulphur, and phosphorus are said to be constituents, but they are found in but minute amount and the combination in which they exist is undetermined. The acid reaction of perfectly fresh oil is due to the presence of several bile acids, and its increase with age to acetic and butyric acids, though some elaim the latter to be present in fresh oil. A substance called *gaduïn* ($C_{35}H_{46}O_9$), probably derived from bile, is also present. Readily soluble in ether and acetic ether (2.5 parts).

Uses.—Cod-liver oil is used to promote reconstruction of tissue in conditions characterized by emaciation with elevated temperature and impaired powers of assimilation. Fat in some form is necessary to the appropriation of the nitrogeous constituents of tissue, as through the emulsionizing influence of bile and the pancreatic secretion, each globule of fat is surrounded by a thin albuminous layer, and in this form (chyle) is capable of absorption into the veins and lacteals. This oil, owing probably to the presence of bile constituents, and possibly to other peculiarities, is more readily appropriated than other fatty matters, and when it does not disagree, causes a rapid increase in body weight, absorption of non-plastic exudations, repair of lesions of tissue, and cessation of nervous symptoms due to diseases characterized by mal-assimilation. Its benefits are strikingly apparent in rachitis, in scrofula when manifested in osseous and fibrous tissue, as in caries and

white swelling, the cachexiæ produced by abscesses, or prolonged suppuration following chronic engorgement of the glands, chronic catarrhal conditions of bronchial and other mucous membranes, exhaustion from excesses, bad food, etc. Alterations in the nutrition of muscle and of the fibrous tissue, especially of articulations, when caused by rheumatism of a non-inflammatory type, may be benefited by persistent use of the oil. Phthisis, especially in its chronic forms, presents conditions in which the remedy is often useful; acute forms are not so suitable, from the reason that in proportion as febrile states exist the digestive functions become impaired, and the oil is likely to disagree. By alternating with a suitable sedative and by decreasing the dose of oil, or using it by inunction, it may be of great value even in acute stages; whenever there exist signs of the oil disagreeing, it should be stopped for a while.

Locally, by inunction, it is very valuable in skin diseases of strumous origin.

Dose.—A teaspoonful (gm. 4.00) three times per day, immediately before meals, is the average adult dose. Various devices have been resorted to to cover the taste, such as taking it in black coffee, lemon juice, beer, and several forms of emulsion; probably an emulsion of the oil with twice its weight of a mixture of yolk of egg and glycerine (see *Glyceritum vitelli*), and flavored by adding five drops each of ether and chloroform for each teaspoonful of oil, is as pleasant a form as can be used.

The addition of purified ox-gall (see *Fel Bovis purif.*) renders its digestion easier. When for any reason it cannot be taken internally, it should be used by inunction and friction; this form is preferable in all cases when febrile movement is marked.

OLEUM OLIVÆ. Olive Oil.

The expressed oil from the fruit of *Olea Europea*; a non-drying oil, of specific gravity at 15° C. (59° F.) 0.9178, of pale-yellow color and bland taste.

Oleaceæ.

Linné. Bentley and Trimen.

Constituents.—Olive oil is composed of a liquid and solid portion, the latter of which separates, in crystalline granules on cooling to 10° C. (50° F.). The liquid portion is triolein or olein ($C_3H_5O_3 \cdot 3C_{18}H_{33}O$); the solid part is a mixture of *tripalmitin*, *triarachin*, and *tristearin*.

Solubility.—Soluble, freely, in ether and chloroform, and to a moderate extent in alcohol.

Tests.—Mix 5 parts each of oil and nitric acid, add 1 part of copper in small pieces, and agitate for a short time; the oil, if pure, will be

converted into elaidin by the nitrous acid, and will have separated in the form of a white opaque solid by the end of six hours, or when perfectly cold. Drying oils, as linseed, remain liquid by this treatment; cotton-seed oil, benne oil, and some others thicken, but do not solidify. All, except olive and almond oils, are more or less discolored. Almond oil, being expensive, is not likely to be present. Using but one part of acid, cotton-seed oil, if present, will redden the liquid in half an hour.

Uses.—Used as a food and as a basis or constituent of certain pharmaceutical preparations, as liniments, ointments, etc. Medicinally, it is usefully employed as a protective to superficial abrasions, cuts, bruises, etc. Internally, as a mild laxative for infants. Applied warm by friction it often proves an important means of controlling sweating, modifying the temperature, and lessening pain and swelling from active engorgement of glands. In acute exanthemata, as measles and scarlatina, its local use is an important auxiliary to other treatment.

Dose.—Internally, as a laxative, $\mathfrak{z}\text{j}$. to $\mathfrak{z}\text{ij}$. = gm. 4.00 to 64.00.

OLEUM TIGLII. Croton Oil.

The fixed oil of the seeds of *Croton tiglium*. It is pale-yellow, acrid in taste, viscid, and of a peculiar rancid odor. That of English make is of a color approaching sherry wine. Both are quite active.

Euphorbiaceæ.

Linné. Bentley and Trimen.

Solubility.—When pure, the oil is soluble in alcohol, ether, fixed and volatile oils.

Constituents.—It contains a peculiar volatile acid, *tiglinic acid*, together with *butyric*, *valerianic*, and *acetic* acids. The bulk of the oil consists of the glycerides of stearic, myristic, palmitic, and lauric acids. The vesicating principle has been announced as *crotonöl*, but its existence is doubtful, which is also true of crotonic acid. The purgative principle has not been identified. *Ol. Jatropha curcas* is said to be used as an adulterant. (See *Curcas*.)

Preparations.—A trituration, $\frac{N}{50}$, as follows:

Take of Croton oil, <i>one part</i>	1
Powdered sugar of milk, <i>forty-nine parts</i>	49
Sulphuric ether, <i>ten parts or sufficient</i>	q. s.

Dissolve the oil in the ether, mix the solution with one-third of the sugar, and triturate until the ether has evaporated; then add the remainder of the sugar in divided portions, triturating thoroughly after each addition. This preparation about corresponds with the homœopathic 1^x from the seed.

Uses.—This drug is a violent irritant to skin and gastro-intestinal tract, causing pustulation, with heat and burning in the former, and great vascular congestion, with hypersecretion from the latter. The latter influence is occasionally utilized to produce free watery evacuations for the relief of dropsies, or to overcome impaction or obstinate constipation of the bowels when no inflammatory symptoms exist. Usually, however, less uncertain and dangerous means can be employed. Mixed with olive oil (1 to 5) it is sometimes useful for its vesicating action on the skin when prompt and prolonged counter-irritant effects are desired. It is thus employed in bronchial catarrh. Turpentine makes its action more prompt. Homœopathic authorities recommend its internal use, in trituration, in skin diseases when the eruption resembles that due to its local action, as eczema, etc.; also, in gastro-intestinal irritation, characterized by sudden choleraic discharges.

Dose.—For purgative influence, grs. $\frac{1}{2}$ = gm. 0.03, in pill made with soap or bread crumbs, or in trituration, $\frac{N}{50}$, grs. ij. to v. = gm. 0.13 to 0.33, in milk, every three hours, until intestinal disturbance indicates approaching results. For irritable conditions, 1 gr. doses of a trituration made by mixing thoroughly the trit., $\frac{N}{50}$, one part, sugar of milk, *ninety-nine parts*.

OPIUM. Opium.

The concrete residue remaining after spontaneous evaporation of the juice obtained by incision from the unripe capsules of *Papaver Somniferum*.

Papaveraceæ.

Linné. Bentley and Trimen.

Constituents.—The following is a table of the alkaloid constituents and their relation to commoner solvents:

Name.	Formula.	Solubility in					Form.
		Alcohol.	Ether.	Chloroform.	Benzol.	Water.	
Morphia.....	$C_{17}H_{19}NO_3$	50 parts	.....	60 parts	.....	1000 parts	Crystalline.
Narcotina.....	$C_{22}H_{23}NO_7$	Moderately	Moderately	Freely	.....	.....	Crystalline.
Codeia.....	$C_{18}H_{21}NO_3$	Freely	Freely	Freely	.....	80 parts	Crystalline.
Pseudomorphia.....	$C_{17}H_{19}NO_4$	Insoluble	Insoluble	Insol.	.....	Insoluble	Crystalline.
Thebaina.....	$C_{19}H_{21}NO_3$	.....	Freely	.....	.....	.....	Crystalline.
Narceia.....	$C_{23}H_{29}NO_9$	Moderately	.....	.....	.....	Moderately	Crystalline.
Papaverina.....	$C_{21}H_{21}NO_4$	Slightly	Slightly	Freely	.....	Slightly	Crystalline.
Rhoëadina.....	$C_{21}H_{21}NO_6$	Slightly	Slightly	Slightly	Slightly	Slightly	Crystalline.
Cryptopia.....	$C_{23}H_{23}NO_5$	Slightly	Slightly	Freely	Slightly	Slightly	Crystalline.
Lanthopia.....	$C_{23}H_{23}NO_4$	Slightly	Slightly	Freely	Slightly	.....	Crystalline.
Meeconidia.....	$C_{21}H_{23}NO_4$	Soluble	Soluble	Sol.	Sol.	.....	Amorphous.
Landania.....	$C_{20}H_{25}NO_4$	.....	.....	Sol.	Sol.	.....	Crystalline.
Codamia.....	$C_{20}H_{25}NO_4$	Soluble	Soluble	Sol.	Sol.	.....	Crystalline.
Peteropia.....	$C_{21}H_{21}NO_5$	.....	Not	fully ex	aminad	.....	Crystalline.
Landanosia.....	$C_{21}H_{27}NO_4$	Soluble	Soluble	.....	Sol.	.....	Crystalline.
Propopia.....	$C_{20}H_{19}NO_5$	Moderately	Moderately	.....	.....	.....	Crystalline.
Hydrocotarnia.....	$C_{12}H_{15}NO_8$	Soluble	Soluble	.....	.....	.....	Crystalline.

Possibly some of the alkaloids of above list may be decomposition products. They usually exist in the drug, combined with its peculiar acids, the most prominent of which is *meconic acid* ($C_7H_4O_7$).

Thebolactic acid, probably identical with lactic acid, is also said to be present. *Meconin* ($C_{10}H_{10}O_4$), a substance which may be formed from narcotina when heated with nitric acid, is also found in the drug. The substances named with an *odorous principle, gum, pectin, resin*, in small amount, a *caoutchouc-like substance, wax, fat, coloring* and *mineral matters*, are the constituents. Good powdered opium will contain not less than fifteen per cent. of morphia.

Tests.—1. *Starch, flour, gum, etc.*; formation of a stiff paste or mucilage, when 25 grains of the powder are triturated with one-half ounce of boiling-water.

2. *Colored extracts, as licorice, etc.*; brown, instead of wine-yellow, color of liquid obtained by adding two ounces of water to the mixture of preceding test (1) and filtering.

3. *Insoluble impurities*; more than 12 grains after drying, of residue left on the filter in test 2.

4. *Soluble impurities*; less than 10 grains of residue obtained as in test 3.

5. *Chalk, ashes, etc.*; neutral or alkaline instead of acid reaction of filtrate of test 2.

6. *Starch*; blue color on adding tincture of iodine to liquid of test 2.

7. *Gum and some salts*; precipitate on evaporating liquid of test 2 to one ounce, and adding twice its bulk of alcohol.

8. *Mineral impurities*; more than 8 per cent. of residue on incineration of a sample of the powder.

9. *Excess of moisture*; more than 21 per cent. loss on drying and powdering the crude drug.

Preparations.—A tincture, $\frac{N}{10}$, as follows:

Take of Opium, in powder, <i>one part</i>	.	.	.	.	.	.	.	.	1
Alcohol, <i>two parts</i>	.	.	.	.	.	.	.	.	2
Water, sufficient to make <i>ten parts</i>	.	.	.	.	.	.	.	.	10

To the opium, in a mortar, add in successive small portions *four parts* of water at 60° F., triturating thoroughly after each addition until the powder is thoroughly softened. Set the mixture aside for twelve hours, express the liquid, and repeat the process twice with the same quantity of water. Mix the expressed liquids, evaporate upon a water-bath to *eight parts*, filter, adding water sufficient to make the filtrate weigh *eight parts*.

Lastly, add the alcohol and mix together.

Note.—Tr. opii, U. S. P., is of the strength $\frac{N}{10}$. Ten parts of the above tincture, $\frac{N}{10}$, represents opium sufficient to equal .15 parts of morphia, equivalent to .18 parts of sulphate; if the opium used is of standard strength, *i. e.*, contains 15 per cent of morphia.

A saccharated extract, $\frac{N}{1}$, as follows:

Take of Opium, *Tincture*, $\frac{N}{10}$, *ten parts* 10

Evaporate to dryness on a water-bath, adding sugar of milk sufficient to make the dried and powdered residue weigh *one* (1) *part*.

Note.—This powder is more free from the nauseating and constipating principles than powdered opium.

A compound powder of ipecac and opium, or Dover's powder, may be extemporized as follows:

Take of Opium <i>Ext. Sacch.</i> , $\frac{N}{1}$, <i>one part</i>	. . . . .	1
Powdered ipecac, <i>one part</i>	. . . . .	1
Sugar of milk, <i>eight parts</i>	. . . . .	8

Triturate thoroughly together.

[Same as Pulvis Ipecac et Opii, U. S. P., 10 grs. = 1 gr. opium.]

Uses.—Used internally to relieve pain and procure sleep, when the skin is soft and cool, the pulse full and without hardness, mucous surfaces moist, eyes dull and pupil dilated or immobile. In small and repeated doses, it is a stimulant to the brain, bringing sleep and rest in exhausted states of that organ. It influences the spinal cord in a similar manner, but in a less degree. This stimulant influence is useful to relieve symptoms indicative of nervous exhaustion, as in the muttering delirium, tremor, and spasm of the typhoid state. Small doses only are admissible in such cases, and should be given when the skin and pulse, etc., are as indicated above. When pain is caused by spasm from peripheric irritation, opium is often useful as a palliative, its anæsthetic action reducing reflex motor activity. Irritation of the mucous membranes of the gastro-intestinal, renal, or cystic surfaces, may cause spasm of their muscular walls or contiguous organs, which are in direct sympathy, from the fact of being supplied from the same nerve-trunk or a common centre; when this spasm causes pain, it can usually be relieved by the judicious use of opium, internally or locally, the latter method being preferable when possible. Laryngeal spasm can be relieved in a similar manner, through the anæsthetic action of opium used by atomizer. For all such cases the amount used should be just sufficient to overcome the spasm without oppressing the brain.

The well known power of opium to check secretion is often utilized to restrain diarrhœas, both acute and chronic; in the former, if used, it

should be only after the expulsion of any disturbing irritant. When increased peristalsis of the stomach and intestines causes irritation of their surfaces, and a diarrhœa of partly digested food shortly after its ingestion, one or two drops of opium, *tincture* $\frac{N}{10}$, taken before eating will control the irritation and excessive movement, and enable digestion to be completed. The diarrhœas of infants are not safely treated with opium, fatal convulsions often resulting on the arrest of the flux.

In rare cases, dangerous diarrhœas of children may be restrained by use of an injection of a decoction of starch and a few drops of opium tincture, $\frac{N}{10}$, but only in those in which the exhausting flux threatens to prove fatal.

Homœopathic physicians use opium in minute doses (3^x to 6^x) in constipation and in torpid and inactive states of the organism characterized by symptoms such as are produced by appreciable or poisonous doses of the drug.

Dose.—The average dose of opium is gr. j. = gm. 0.06, or equivalent in other forms.

ORIGANUM VULGARE. *Origanum*.

The fresh herb.

Labiatae, Satureieae.

Linné. Bentley and Trimen.

Constituents.—The essential oil, *Oleum Origani*, is the most important. It is of specific gravity 0.87 to 0.91, of pale-yellow color, thickens and darkens in color with age, and is soluble in alcohol. Its composition is said to be $(C_{10}H_{16})_5O$, but the point is unsettled. Oil *origanum* of commerce is red or crude oil of thyme. The true *Ol. origani* is scarce. *Tannin* and a *bitter principle* are said to be present.

Preparations.—The volatile oil, obtained by distilling the fresh herb with water.

A tincture, $\frac{N}{1}$, with alcohol, from the herb, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, with alcohol, from the herb, as in Sec. 45, Part I.

A tincture, $\frac{N}{10}$, with alcohol, from the oil, as in Sec. 46, Part I.

Uses.—Used as a stimulant carminative to relieve flatulence, colic, and painful menstruation. The oil is anæsthetic, and is occasionally applied, locally, to relieve neuralgia, toothache, etc.

Dose.—*Origanum Vulg.*, Tinct. $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent. The oil, gtt. j. = gm. 0.06, or equivalent.

Origanum Majorana, or sweet marjoram, *Linné*, may be prepared as above, and used in the same manner, though it is principally employed as a condiment for food.

OXALIS ACETOSELLA. Wood Sorrel.

The fresh plant in flower.

Geraniaceæ, Oxalidææ.

Linné. Gray.

Constituents.—This plant and other species of the same genus contain *acid potassium oxalate*, which is the only constituent of interest.

Uses.—An infusion of oxalis has been employed as a refrigerant acidulous drink in fevers. The fresh plant may be used as a salad. The expressed juice or the bruised plant has been used as an application to foul ulcers, and is one among many of the questionable “cancer cures” that have been recommended.

OVUM. Egg.

The egg of *Gallus banekiva*, var. *Domesticus*.

Aves, Gallinæ.

Teinnick.

Constituents.—The white of the egg contains *albumen*, which is regarded as a sodium compound ($\text{HNaC}_{72}\text{H}_{110}\text{N}_{18}\text{SO}_{22}, \text{H}_2\text{O}$). It forms, with phosphates and sulphates of the alkalies, lime, silica, magnesia, and iron, about 13 per cent. of the weight of the white, its balance being water. Albumen ovi is precipitated by most mineral and some organic acids, exceptions being phosphoric, acetic, and tartaric acids. It forms insoluble compounds with salts of aluminium, lead, tin, mercury, and copper, and with gallo-tannic acid. Alcohol coagulates it, as does boiling, which renders it insoluble in water. The yelk or yolk of egg (*vitellus ovi*) contains 50 to 55 per cent. of water, and 16 to 18 per cent. of a substance termed *vitellin*, which resembles casein, and is mixed with albumen (about 25 per cent.), fat (mostly olein and margarin, 29 to 31 per cent.), salts, coloring matter, sugar, and cholesterin. Egg-shell (*testa ovi*) is principally (97 per cent.) calcium carbonate, with 2 per cent. organic matter, and 1 per cent. phosphates of magnesium and calcium.

Preparations.—Glyceritum Vitelli as follows:

Take of Yolk of egg, <i>four parts</i>	.	.	.	.	.	.	.	4
Glycerine, <i>five parts</i>	.	.	.	.	.	.	.	5

Mix thoroughly by trituration in a mortar.

Uses.—Albumen ovi is used as an antidote to retard the absorption and neutralize the action of poisonous metallic salts until they can be evacuated (see above).

Glyceritum vitelli, to emulsionize oils. (See *Cod-Liver Oil*.)

The whole egg, as food.

PÆONIA OFFICINALIS. Peony.

The fresh root gathered in the spring.

Ranunculaceæ, Pæoniæ.

Linné.

Constituents.—A *volatile oil*, soluble in alcohol, and having a pale-yellow color when dissolved out by ether. Its odor, when distilled from the fresh root, resembles oil of bitter almonds; *tannin*, *starch*, *sugar*, *malates*, *oxalates*, and *phosphates* are present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug deserves investigation. In poisonous doses it produces vertigo, nausea, and vomiting, followed by heaviness of the head and staggering gait, violent colic, cutting and burning pain in the rectum and anus. Homœopathic practitioners employ it in diseases characterized by the symptoms given, hemorrhoids, ulcer, and fissure of the anus, etc.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent, to water \bar{z} iv. = gm. 128.00. Teaspoonful (gm. 4.00) doses, repeated with care.

PANAX QUINQUEFOLIUM. Ginseng.

The recent root. (*Aralia Quinque. Gray.*)

Araliaceæ.

Linné.

Constituents.—A peculiar principle, *panaquilon* ($C_{12}H_{25}O_9$), soluble in alcohol, insoluble in ether, of yellow color and sweet taste, is the constituent of the most interest. *Resin*, *gum*, *starch*, and *albumen* are also present.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Ginseng is a feeble agent, but may be usefully employed in gastric derangements of nervous origin.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

PANCREATINUM. Pancreatin.

The purified and dried, mixed albuminoid ferments of the fresh pancreatic gland of the beef. It is of a light-yellow color, without animal odor, brittle, transparent, and dissolves in cold water to a clear, slightly yellow alkaline liquid. Alcohol, heat, and hydrochloric acid precipitate its solution.

Constituents.—Three peculiar ferments have been announced as

present, *myopsin*, *amylopsin*, and *steapsin*. The first is said to be the solvent for albumen, the second the agent which converts starch into glucose and dextrine, and the last to have the power to decompose, or at least to emulsify fats.

Uses.—This agent is occasionally useful in cases in which indigestion of fats and starches is the cause of impaired nutrition. Pepsin is of but little value in these cases, while pancreatin often benefits. The most efficient mode of administration is per rectum with food, especially in cases where food cannot be taken per orum, owing to gastric irritability, or to grave lesions of the digestive organs.

Dose.—Grs. iij. to v. = gm. 0.20 to 0.33, after eating, in pill or powder. Hot food destroys its activity.

For injection, dissolve in cold water, and add to milk, or milk and fat, or finely grated or scraped lean beef. The mixture should be stirred in a mortar to a consistence that will admit of injection from a syringe with a large nozzle. Lukewarm (not hot) water may be added if required.

PAREIRA. Pareira Brava.

The root of *Chondodendron tomentosum* (Ruiz et Pavon).

Menispermaceæ.

Bentley and Trimen.

Constituents.—*Pelosina*, or *cissampelina*, an alkaloid, since its discovery proven to be identical with *beberia* of *Nectandra rodiaei*; *resin*, soluble in alcohol; a *yellow bitter principle*, soluble in alcohol and ether; *brown coloring matter*, soluble in alcohol and water, and the true character of which is not settled; alkaline and earthy *salts* form the constituents. The true origin of the drug has been but recently established (1873), having prior to that been referred to *Cissampelos pareira brava* instead of *chondodendron*.

Preparations.—A tincture, $\frac{N}{1}$, with a mixture of alcohol, two parts, glycerine, three parts, water, five parts, as in Sec. 40, Part I.

Uses.—Used for its direct influence upon the mucous surfaces of urinary tract in cases characterized by constant urging to urinate, straining with pain in the urethra, urine alkaline, notably in the morning, and containing thick, tenacious mucus.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xxx. = gm. 0.33 to 2.00, largely diluted. When symptoms are acute, small doses should be used, and associated or alternated with gelseminum when the spasmodic symptoms are marked.

PASSIFLORA INCARNATA. Passion Flower.

The fresh plant in blossom.

Passifloraceæ.

Linné.

Constituents.—The plant has not been analyzed.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Some testimony, apparently reliable, indicates that this drug possesses a remarkable influence over the sensory and motor nerves, but especially the latter. It is strongly recommended in cases characterized by exaggerated motor phenomena, as in trismus, opisthotonos, convulsions, and even tetanus; also in neuralgic affections. It deserves investigation.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent, increased and repeated with caution.

PENTHORUM SEDOIDES. Virginia Stone Crop.

The fresh herb.

Crassulaceæ.

Linné.

Constituents.—A variety of tannin is the only constituent of interest.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This remedy will be found of value in the treatment of chronic disorders of mucous membranes, characterized by irritability with or without increased secretion. Nasal catarrh, pharyngitis, laryngitis, leucorrhœa, infantile and other diarrhœas often present conditions in which it may be successfully employed.

Dose.—Tincture, $\frac{N}{I}$, gtt. ij. to v. = gm. 0.13 to 0.33, or equivalent in a little water. Locally, diluted, as a wash, or by spray in suitable cases.

PEPO. Pumpkin Seed.

The seed of *Cucurbita Pepo*, in the fresh state.

Cucurbitaceæ.

Linné.

Constituents.—A minute amount of *volatile oil*, *resin*, *fixed oil*, *starch*, and *sugar* are the principal constituents. An alkaloid, *cucurbitin*, has also been announced, but its existence is not considered proven. Recent investigations indicate that the active constituent is the *resin* found in the dark-green colored fourth or inner coat of the

perisperm, and that the occasional failure of the remedy is due to the absence of this principle in the form of preparation used.

Preparations.—A freshly-prepared emulsion, as follows:

Take of Pumpkin seed, fresh, <i>two parts</i>	.	.	.	.	.	.	.	2
Water, <i>sufficient</i>	.	.	.	.	.	.	.	q. s.

Beat the seed in a mortar until the outer envelope is broken, then add *one part* of water and rub the mixture briskly; continue to beat and rub it, with occasional addition of small portions of water, until *eight parts* have been added and the outer envelope is completely separated from the pulp, which is converted by the process into a smooth emulsion. Strain, by passing it through a wire sieve, rubbing the separated envelopes to remove, as thoroughly as possible, adherent portions of the pulp. The strained emulsion may be sweetened if desired, or diluted with milk when taken.

Substituting troyounces for parts will make an adult dose.

The oil, as follows:

Take of Pumpkin seed, <i>two parts</i>	.	.	.	.	.	.	.	2
Ether, <i>two parts</i>	.	.	.	.	.	.	.	2

Beat the seeds in a mortar until thoroughly broken, then add the ether in small portions at a time, rubbing until well mixed; transfer to bottle, cork well, and let stand ten hours; then change to a small funnel or percolator, and pass sufficient ether through the mass to obtain two parts of solution; allow it to evaporate in a current of air until it has lost the odor of ether.

Substituting ounces for parts, the above makes an adult dose.

Uses.—Used to expel tapeworm, giving the emulsion as above prepared at night, allowing no supper, and but light diet during the day. The following morning a dose of castor-oil should be given, and the addition of 30 to 60 drops of ether makes the treatment more certain.

The oil as above prepared is used in doses of half an ounce, repeated in two hours, and followed in four hours more with castor-oil, with or without ether, as above.

Above are adult doses.

PEPSINUM. Pepsin.

The purified digestive principle of the gastric juice of pig, sheep, or calf. It should be without animal odor or taste, white, or nearly so, when in powder, and easily soluble in water (50 parts) at 25° C. (77° F.) to a slightly opalescent liquid, becoming clear and colorless on adding a few drops of hydrochloric acid.

One part dissolved in 1500 parts of water and 25 parts of hydrochloric acid, should dissolve 100 parts of egg albumen (which has been boiled in the egg for four minutes, and cut into small pieces) after repeated agitation at a temperature of 40° C. (104° F.), maintained during four to six hours.

Preparations.—A saccharated pepsin, *Pepsinum saccharatum*, prepared by mixing the still moist, freshly-made pepsin with sugar of milk, drying at the temperature of the air and powdering. The strength of the product is to be so adjusted that 1 part of it dissolved in 500 parts of water and 7.5 parts of hydrochloric acid will dissolve at least 50 parts of coagulated egg albumen, at a temperature of 40° C. (104° F.), in five or six hours. [U. S. P.]

A solution of saccharated pepsin, *Liquor Pepsini*, $\frac{N}{25}$, as follows:

Take of Saccharated pepsin, <i>four parts</i>	. . . . .	4
Hydrochloric acid, <i>two parts</i>	. . . . .	2
Glycerine, <i>forty parts</i>	. . . . .	40
Water, <i>sufficient</i>	. . . . .	q. s.

Dissolve the saccharated pepsin in water, *fifty* (50) *parts*, previously mixed with the hydrochloric acid; filter the solution into a bottle containing the glycerine, and add water through the filter until the total product weighs *one hundred* (100) *parts*.

Uses.—When the digestion in the stomach of the nitrogenous constituents of food is sluggish or impaired, pepsin may prove useful to facilitate its solution and conversion into readily assimilable peptones. The functional gastric and gastro-intestinal disorders of infants and of children during dentition may often be promptly relieved by pepsin given immediately before or after meals; under its use the pain, diarrhoea, and vomiting usually cease, and increase of flesh and improvement in complexion testify to the betterment of the digestive and assimilative processes. When the starches and fats are not appropriated, pancreatin is preferable, and may be used in connection with pepsin unless the nitrogenous foods do not disagree, when the latter will not be needed.

Dose.—Saccharated pepsin, grs. x. = gm. 0.66, immediately before or after eating. Solution of saccharated pepsin, ʒj. to ij. = gm. 4.00 to 8.00.

PETROLATUM. Petroleum Ointment. [Petrolatum, U. S. P.]

The purified, yellowish, fat-like residue left after removing by distillation the lighter and more volatile hydrocarbons ($C_{16}H_{34}$, etc., to $C_{32}H_{64}$, etc.) of American petroleum; melting point 40° to 51° C.

(104° to 125° F.); the first being the most commonly used variety. It should have neither odor nor taste.

Solubility.—Soluble in chloroform, ether, bisulphide of carbon, benzine, benzol, oil of turpentine, fixed and volatile oils, and in boiling absolute alcohol. Insoluble in alcohol or water.

Tests.—*Animal vegetable fats, oils or resin*; separation of oily substance on supersaturating with diluted sulphuric acid, a solution of 5 gm. of soda in 25 gm. of water, which has been digested for half an hour with 5 gm. of petroleum ointment. *Organic impurities*; dark color of sulphuric acid, specific gravity 1.540, when left in contact with the liquefied ointment for two hours after thorough agitation.

Uses.—As a basis for ointments, and as an unirritating dressing to ulcers, abrasions, eruptions, and excoriations, to protect from the air. See Sec. 50, Part I.

PETROSELINUM SATIVUM. Parsley.

The fresh root. (*Apium petroselinum*. Linné.)

Umbelliferæ, Orthospermæ.

Hofm.

Constituents.—*Apiin* ($C_{24}H_{28}O_{13}$), a white, inodorous, and tasteless powder, probably a glucoside, which is soluble in hot water and alcohol; *volatile oil, starch, gum, and sugar* are the constituents of the root.

A peculiar, colorless, oily liquid body, called *apiol*, is separated from the fruit of the parsley, is of pungent taste, acid reaction, specific gravity 1.07, and soluble in ether, alcohol, chloroform, and glacial acetic acid.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Useful as a vascular stimulant to increase the functional activity of the uterus and ovaries in amenorrhœa, dysmenorrhœa or scanty menstruation, or the kidneys as in some forms of dropsy, strangury, and painful micturition; also for stimulant influence on mucous surfaces, as in some obstinate cases of gonorrhœa. *Apiol* has some reputation in the treatment of intermittents and malarial neuralgiæ, and may be advantageously resorted to when for any reason quinia is inadmissible.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to 3ss. = gm. 0.33 to 2.00, or equivalent. *Apiol*, as antiperiodic, in doses of grs. v. = gm. 0.33 in capsules, and repeated two or three times, so as to induce the maximum stimulant effect at the time of the expected paroxysm.

PHELLANDRIUM AQUATICUM. Water Fennel.

The recent fruit (*Enanthe phellandrium*, *Lamarck*).

Umbelliferae, *Orthospermæ*.

Linné.

Constituents.—A *volatile oil*, which is limpid, of brownish-yellow color, neutral, soluble in alcohol, ether, and oils, and of specific gravity .86, is the most important constituent. *Resin, fat, and wax*, are also present, with other principles that are unimportant.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—The plant, which is sometimes called five-leaved water hemlock, should not be confounded with the *elicuta virosa*, which is powerfully poisonous. Although the water fennel has been compared in action to *conium mac.*, its powers are not so marked, and are but imperfectly defined. It is most useful in cases where it is desirable to diminish excessive bronchial secretion, as in chronic bronchitis and whooping-cough. Its value in these cases is doubtless partly due to its power of relieving the spasmodic character of the cough.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

PHOSPHORUS, P. At. wt. 31. Phosphorus.

The element as a translucent, nearly colorless, or slightly yellow solid, of the lustre and hardness of beeswax at ordinary, but brittle at low, temperatures. Specific gravity 1.77, as usually found in commerce. It melts at 44° C. (112.2° F.), and ignites when exposed to the air at a temperature a little above this point, for which reason it must be cut and preserved under water. When maintained for some time at a temperature of 232° C. (449.6° F.) in an atmosphere free from air, it undergoes a modification, is more slowly oxidized, and changes to an opaque red color, and is then known as amorphous or red phosphorus. It differs in solubility from the ordinary form, and is largely used in the manufacture of matches.

Solubility.—Ordinary phosphorus is soluble in ether, carbon bisulphide, certain oils, and to a small extent in alcohol; it is insoluble in water.

Preparations.—A solution of phosphorus in almond oil (*Oleum phosphoratum*, $\frac{N}{100}$), as follows:

Take of Phosphorus, <i>one part</i>	.	.	.	.	.	.	.	1
Bisulphide of carbon, <i>five parts</i>	.	.	.	.	.	.	.	5
Expressed oil of almonds, <i>ninety-nine parts</i>	.	.	.	.	.	.	.	99

Rapidly weigh the phosphorus previously cooled with ice, dry it thoroughly with blotting paper, and dissolve cautiously in the bisulphide of carbon; add the solution to the oil contained in a flask fitted with a stopper perforated for two tubes, one of which nearly reaches to the surface of the oil. Heat the flask in a water-bath to a temperature of 50° C. (122° F.), while a slow stream of carbonic-acid gas is passed through the longer tube over the surface of the oil, until the odor of bisulphide of carbon has disappeared. Lastly, transfer the oil, by means of a glass pipette, to vials of not over one ounce (gm. 30.00) capacity, which have previously been rinsed with ether, but not dried; close tightly and keep in a dark, cool place.

[Oleum phosphoratum, U. S. P. = $\frac{N}{100}$.]

A tincture, $\frac{N}{500}$, by adding a stick of phosphorus to a convenient quantity of alcohol, placing in a water-bath until the phosphorus is melted, shaking until cool, and decanting.

Uses.—Phosphorus is an energetic poison, and is only useful remedially when given in small doses. In states of depression, especially of the organic or vegetative nervous system, it is a valuable stimulant, often producing most marked improvement in nutrition of tissue, and the promotion of normal function. The genito-urinary organs are directly influenced by it, and in vesical or prostatic irritation, or in cases of spinal depression, especially when caused by sexual abuses or excesses, it is a valuable remedy when used in small doses.

Dose.—Add tincture, $\frac{N}{500}$, gtt. xv. to 3j. = gm. 1.00 to 4.00, to water \mathfrak{z} iv. (gm. 128.00), and give a teaspoonful (gm. 4.00) at a dose.

Ol. phosphoratum, $\frac{N}{100}$, gtt. j. to ij. = gm. 0.06 to 0.13, in capsules.

PHYSOSTIGMA VENENOSUM. Calabar Bean.

The seed.

Leguminosæ, Papilionaceæ.

Balfour. Bentley and Trimen.

Constituents.—The alkaloid, *physostigma* or *eserina* ($C_{15}H_{21}N_3O_2$), a colorless, amorphous, easily fusible body, soluble freely in alcohol, ether, benzol, chloroform, and carbon bisulphide, partially soluble in water, and completely neutralizing acids, is the constituent of most interest. A neutral, *crystalline body*, resembling cholesterin, and soluble in benzine, ether, and chloroform, an alkaloid *calabarina*, soluble in alcohol and water, insoluble in ether, *mucilage*, *starch*, and *fat* are the other components.

Preparations.—A tincture, $\frac{N}{2}$, with alcohol, 8 parts, water, 2 parts, as in Sec. 43, Part I.

An extract, with alcohol, 8 parts, water, 2 parts, as in Sec. 19, Part I.

A powdered extract, $\frac{4N}{I}$, with alcohol, 8 parts, water, 2 parts, as in Sec. 20, Part I.

A glycerite, $\frac{2N}{I}$, as follows:

Take of Tincture, $\frac{N}{2}$, <i>twenty parts</i>	. . . . .	20
Glycerine, <i>four parts</i>	. . . . .	4

Mix, and heat on a water-bath until the mixture is reduced in weight to *five (5) parts*.

Gelatine disks, for application to the eyes, may be prepared as follows:

Take of Glycerite, $\frac{2N}{I}$, <i>seven parts</i>	. . . . .	7
Gelatine, <i>four parts</i>	. . . . .	4

Warm together on a water-bath until the gelatine is dissolved, and mould into slender cylinders, from which, when cold, minute disks may be cut with a sharp knife.

[Tinctura Physostigmatis, U. S. P. = $\frac{N}{10}$.]

Uses.—This drug depresses, and in poisonous doses annihilates the motor and reflex activity of the cord, and causes loss of sensibility to pain, muscular weakness, immediately followed by complete paralysis, although muscular contractility is not impaired, nor is the irritability of the motor or the sensibility of the sensory nerve-trunks perceptibly affected. The lesion appears to be one of the gray matter of the cord, destroying the capacity of the anterior horns to conduct efferent motor impulses from, and the posterior horns to transmit afferent sensory impressions to the brain. The therapeutic applications are not as yet clearly defined, though it has the reputation of being the most successful remedy yet discovered for tetanus and tetanoid or tonic convulsions, administered in large doses, and with sufficient frequency to completely relax the spasm and maintain the impression. The poisonous action of this drug is antagonized by atropia used hypodermically, in doses of $\frac{1}{30}$ of a grain (gm. 0.002).

Paralysis and tremors, when not due to structural changes in the nerve-centres, are occasionally cured by small doses; the same is true of chorea and cerebro-spinal meningitis. Given internally, or applied locally, it causes contraction of the pupil, which property is usefully employed by oculists in several diseases of the eye. Its depressing power upon the respiratory function and heart's action has suggested its careful trial in congestion of the lungs, pneumonia, and bronchitis.

Dose.—In tetanus, extract, $\frac{1}{3}$ of a grain (gm. 0.02) or gtt. 10 = gm. 0.66 of tincture $\frac{N}{2}$. In paralytic condition, tincture $\frac{N}{2}$, gtt. v. to x. =

gm. 0.33 to 0.66 to water \mathfrak{z} iv. (gm. 128.00). Teaspoonful doses (gm. 4.00).

The glycerite for local use to contract the pupil.

PHYSOSTIGMEÆ SALICYLAS. Salicylate of Physostigmia.

The pure salt, in colorless, shining, needle-shaped crystals.

Solubility.—Soluble in water (130 parts) at ordinary temperatures, and in hot water (30 parts); also soluble in alcohol (12 parts).

Uses.—In aqueous solution, $\frac{N}{100}$, made with boiling water and allowed to cool, it is used to contract the pupil of the eye in cases where that effect is desired. (See *Calabar Bean*.)

[Syn. Physostigminæ Salicylas.]

PHYTOLACCA DECANDRA. Poke.

The fresh root (*Phytolacæ Radix*).

The fresh ripe fruit (*Phytolacæ Bacca*).

Phytolaccaceæ.

Linné. Gray.

Constituents.—No satisfactory analysis of this drug has been made. The root contains *resin* and probably an *acrid principle* distinct from the resin, but which is probably volatile, and has not been isolated. *Tannin*, *starch*, and other common principles are present, with quite a large amount of alkaline and earthy salts. The active principles of the berries are doubtless identical with those of the root; the medicinal activity of both are impaired by complete drying and age.

Preparations.—From the root:

A tincture, $\frac{N}{4}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

From the fruit:

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A dried extract, $\frac{4N}{1}$, from the recently dried root, with alcohol, as in Sec. 20, Part I.

Note.—The dried extract represents part only of the medicinal virtues of the root.

Uses.—*Phytolacca* is stimulant or irritant, according to dose, to the ganglionic nervous system, and is of marked utility in aberrations of the function of tissues and organs under its control; this is especially true of the glandular organs of the gastro-intestinal mucous surfaces, those of the urinary tract, the throat, and mammæ. This stimulant influence is also marked upon the periosteal, fibrous, and cutaneous tissues. When the mucous surfaces of the fauces are full, of dark color, the ton-

sils swollen, throat dry, or covered with patches of tenacious secretion or ash-colored exudation, the external glands in the cervical region swollen and tender, as in diphtheria and other diseases involving these tissues, *phytolacca* will be found one of the most reliable remedies. Rheumatism, involving white, fibrous tissue, cutaneous eruptions, syphilitic or otherwise, and ulcerations, when due to depressed function or imperfect secretion, come under its curative influence. Threatened abscess of the mammary, parotid, or submaxillary glands can usually be averted by its prompt use, internally and locally; suppuration in other parts has also been prevented by a similar use of the drug.

Dose.—Tincture, $\frac{x}{i}$, gtt. x. to $\mathfrak{z}j$. = gm. 0.66 to 4.00, or equivalent, to water $\mathfrak{z}iv$. = gm. 128.00. Teaspoonful doses (gm. 4.00). In proportion as the condition is one of glandular torpidity, or is of long standing, the dose may be increased, lessening or suspending it when a pinching sensation in the epigastrium is complained of. When febrile movement is marked, associate with a proper remedy to control the circulation.

PILOCARPIÆ HYDROCHLORAS, $C_{23}H_{34}N_4O_4 \cdot 2HCl$. M. wt. 530.
Hydrochlorate of Pilocarpia.

The pure salt in small white crystals, of a faintly bitter taste, and somewhat hygroscopic.

Solubility.—Readily soluble in water, forming a neutral solution, and also soluble in alcohol, slightly in ether and chloroform.

Uses.—Locally, used to contract the pupil, and hypodermically to produce salivation and profuse sweating. (See *Pilocarpus Penn.*)

Dose.—For local use, a solution, $\frac{x}{\mathfrak{v}}$, in water.

Hypodermically, gr. $\frac{1}{4}$ = gm. 0.02, for its full effect.

PILOCARPUS PENNATIFOLIUS. Jaborandi.

The leaflets.

Rutaceæ, *Xanthoxyleæ*.

Lemaire. Bentley and Trimen.

Constituents.—An alkaloid, *pilocarpina* or pilocarpia ($C_{23}H_{34}N_4O_4$), soluble in alcohol, chloroform, and ether, but uncrystallizable; a *volatile oil*, consisting of a hydrocarbon ($C_{10}H_{16}$), specific gravity .85, boiling at $178^\circ C$. ($352.4^\circ F$.), a second hydrocarbon boiling at a higher, and a third, which is solid and transparent, at a still higher temperature. Some observers claim to have discovered evidence of the presence of a second alkaloid, but the claim has not been confirmed.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—This interesting drug produces, in large doses, a diminution of the nervous influence which controls the circulation of the salivary glands, those of the skin, and, to a certain extent, the gastro-intestinal tract. This causes dilatation of the vessels, with profuse sweating and salivation, persisting from three to six hours, and followed by considerable prostration. The heart's action is accelerated, though the arterial pressure is reduced, and, when in full action, an uneasy feeling in the supra-pubic region, with frequent desire to pass water, which is diminished in amount, is almost constantly present. Efforts have been made to utilize the remarkable power of this drug to reduce the amount of fluid in the body in such diseases as the various forms of dropsy and hydrothorax; also in diabetes insipidus to reduce the urine, in certain skin diseases, and to cause elimination of urea in cases of uræmic poisoning. The results, however, have not been so uniformly satisfactory as to be unqualifiedly recommended, for positive injury has resulted in many cases. Locally applied, it contracts the pupil. In minute doses, it acts as a vaso-motor stimulant, and has proven beneficial in conditions such as are produced by the large dose as above characterized.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to 3j. = gm. 0.06 to 4.00, or equivalent (See *Pilocarpinæ Hydrochloras*.)

PIMENTA. Allspice.

The unripe dried berries of *Eugenia Pimenta*.

Myrtaceæ.

De Condolle. Bentley and Trimen.

Constituents.—A *volatile oil*, *Oleum Pimentæ*, which is colorless or slightly yellow, and of specific gravity 1.0374 at 10° C. (50° F.), is the important constituent. It closely resembles oil of cloves in composition, containing, like it, a light hydrocarbon and eugenic acid, or eugenol ($C_{10}H_{12}O_2$), and being freely soluble in alcohol; its odor, however, is pleasanter. The berries also contain *resin*, *fixed oil*, *tannin*, gum, and sugar.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

The oil, distilled with water from the berries.

Uses.—Pimenta is employed in substance as a condiment, and may be administered medicinally in relaxed and debilitated conditions of the digestive tract, and as a flavor to other remedies, or to correct griping and relieve flatulence.

Dose.—Pimenta, grs. v. to xv. = gm. 0.33 to 1.00, or equivalent, in tinctures.

Ol. Pimentæ, gtt. j. to iij. = gm. 0.06 to 0.20.

PIPER METHYSTICUM. Kava Kava.

The root.

Piperaceæ.

Forster.

Constituents.—Kava kava contains *acid resin*, a peculiar principle, *methysticin* or *kavalin*, which forms tasteless, silky needles, readily fusible, soluble in alcohol and ether, slightly soluble in water, a small amount of *volatile oil*, which is of a pale-yellow color, *starch* and *gum*, and salts.

Preparations.—A tincture, $\frac{x}{i}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{x}{ii}$, with alcohol, as in Sec. 43, Part I.

Uses.—This new remedy increases the functional activity of skin, salivary glands, and the kidneys. Its active principle is partially, at least, eliminated by the latter, allaying irritability and arresting mucopurulent secretion of the urethro-vesical mucous surfaces. This property makes it a valuable agent in urethritis, vaginitis, and acute and chronic blennorrhagias. It also peculiarly excites the nervous system, producing a species of intoxication, which indicates the existence of properties worthy of further study.

Dose.—Tincture, $\frac{x}{i}$, gtt. x. to 3j. = gm. 0.66 to 4.00, or equivalent, every three hours, in a glass of water.

PIPER NIGRUM. Black Pepper.

The unripe dried berries.

Piperaceæ.

Linné. Bentley and Trimen.

Constituents.—The most important constituent is a peculiar substance, *piperina* or *piperine* ($C_{17}H_{19}NO_3$), which, when pure, occurs in colorless crystals, which are rhomboidal prisms, without odor and but little taste, except in alcoholic solution, which is pungent and peppery; it is soluble in alcohol (30 parts), ether (60 parts), and acetic acid; it is neutral to test paper, fusible when heated, and is a weak base, undergoing decomposition when boiled with alcoholic solution of potassic hydrate, forming piperic acid ($C_{12}H_{10}O_4$), and an alkaloid, piperidina ($C_5H_{11}N$). The berries contain a colorless *volatile oil*, which is a hydrocarbon isomeric with oil of turpentine ($C_{10}H_{16}$), and has the odor of pepper, though without its taste; a *pungent resin* of dark-green color, soluble in alcohol, ether, and alkalies, with gum and starch, is also found present in considerable amount.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

An oleoresin $\frac{4N}{1}$, with alcohol, as in Sec. 25, Part I.

(This oleoresin differs from that of the U. S. P., as the piperine is not removed.)

Piperina as above described.

Uses.—Pepper is powerfully stimulant, both generally in its influence on the nervous system, and locally to the skin and gastrointestinal surfaces. In atonic conditions of the stomach and intestinal canal it is a remedy of great value, promoting digestion, and relieving colic and flatulence. Its influence on the nervous system is utilized to advantage in intermittents in connection with or as a substitute for quinia.

Dose.—Powdered pepper, grs. v. to xv. = gm. 0.33 to 1.00, or equivalent in tinctures or oleoresin.

Piperine as an antiperiodic, grs. j. to x. = gm. 0.06 to 0.66, three times per day.

PISCIDIA ERYTHRINA. Jamaica Dogwood.

The dried bark of the root.

Leguminosæ.

Linné. Nuttall.

Constituents.—The drug has not been thoroughly investigated. A *resinous principle* is present, and there is some evidence of an alkaloid. Alcohol dissolves its active principles.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—This drug is strongly recommended as an anodyne and hypnotic, somewhat resembling opium in its action, but not producing the disagreeable languor, depression, and arrest of secretion which usually result from the use of the latter drug. From published accounts it will prove an appropriate and useful agent to control pain of reflex origin, especially when accompanied with exaggerated motor phenomena, excessive restlessness, and insomnia. Cranial neuralgia, otalgia, odontalgia, the pain of dysmenorrhœa, ovarian or uterine neuralgiæ, rheumatism, sciatica, etc., present conditions in which it may be employed. Bronchitis, asthma, nervous cough, chorea, tetanus, writers' cramp, etc., are also said to be benefited by its use. Locally, it is said to be effective in parasitic skin diseases, and diluted (1 to 10) with water to benefit ulcerating surfaces. The drug requires further study to determine definitely its true curative scope.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent, diluted and repeated until skin is moist or relief is obtained.

PIX LIQUIDA. Pine Tar.

Impure turpentine obtained by burning the wood of *Pinus palustris*, *Miller*, and other species of *Pinus*.

It is a viscid liquid, of blackish-brown color, peculiar odor, sharp taste, and acid reaction.

Solubility.—Soluble in volatile oils, alkalies, ether, chloroform, and alcohol, but slightly in water.

Constituents.—Being obtained by a species of destructive distillation, its composition is very complex. Acetic acid, acetone, carbolic acid, creasote, methylic alcohol, paraffine, naphthalin, toluol, xylol, cuneol, methol, and many other less perfectly understood substances are found in tar. By distillation, it may be separated into oily bodies, called light and heavy oil of tar, and the residue in the still constitutes black pitch (*Pix navalis*).

Preparations.—A glycerite, $\frac{N}{10}$, as follows:

Take of Tar, <i>one part</i>	1
Glycerite of starch, freshly prepared, and still warm, <i>nine parts</i>	9

Proceed as in Sec. 22, b, Part I.

Uses.—The most useful property of tar is its curative influence in scaly eruptions of the skin. The thorough application of the glycerite, $\frac{N}{10}$, after cleansing the surface by a warm bath, will be found curative in the majority of those disorders where itching is the prominent and annoying symptom. It is also a valuable application to boils, ulcers, fissured nipples, serofulous sores, hemorrhoids, and to suppurating burns. It corrects fetor and promotes healing. Tar water, made by stirring one part of tar with ten parts of water, and macerating several days, is useful in bronchitis, pulmonary phthisis, when hectic symptoms are absent, in vesical catarrh, gleet, and leucorrhœa.

It may be used internally, locally as a wash, or by atomizer, according to locality.

PLANTAGO MAJOR. Great Plantain.

The fresh plant.

Plantaginææ.

Constituents.—These have not been investigated.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug is curative in conditions characterized by hyperæmia, profuse secretion, and threatened inflammation with irritation and pain, which is pricking, itching, or burning when affecting the skin, boring and tensive when the teeth or ears are involved, and pinching or colicky when the gastro-intestinal mucous surfaces is the seat of the disease. It is successfully employed, used internally and locally, for erysipelas, burns, bruises, chilblains, inflammations of glands, especially in mammæ, erythematous skin diseases, toothache, earache, cholera infantum, diarrhœas, and dysenteries; in conditions of the intestinal canal favorable to the presence of worms, and when the presence of the latter causes enuresis from laxity of sphincter vesicæ. The remedy deserves more frequent use.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00 to water $\bar{3}$ iv. Teaspoonful doses (gm. 4.00).

Locally, diluted, when parts involved are accessible.

PLATINUM, Pt. At. wt. 198. Platinum.

The pure metal in black powder, freshly precipitated, well washed, and dried.

Preparations.—A trituration, $\frac{N}{10}$, as in Sec. 49, Part I.

PLATINI CHLORIDUM, $PtCl_4 \cdot 5H_2O$. M. wt. 430.

Platinic Chloride.

The pure salt in red crystals, containing 42 per cent. of platinum.

Preparations.—A solution, $\frac{N}{10}$, as follows:

Take of Platinic chloride in crystals, <i>one part</i>	.	.	.	.	1
Water, <i>nine parts</i>	.	.	.	.	9

Dissolve the crystals in the water.

PLATINI ET SODII CHLORIDUM. Chloride of Sodium and Platinum.

An orange-yellow powder obtained by evaporating, with constant stirring until dry, 3 parts of platinic chloride and 5 parts of sodium chloride.

Preparations.—A solution, $\frac{N}{10}$, as follows:

Take of Chloride of sodium and platinum, <i>one part</i>	.	.	.	.	1
Water, <i>nine parts</i>	.	.	.	.	9

Dissolve the powder in the water.

PLATINI IODIDUM, PtI_4 . M. wt. 706. Platinic Iodide.

The pure salt in brown-black, amorphous, tasteless powder, insoluble in water, soluble in potassium iodide or carbonate.

Preparation.—A trituration, $\frac{N}{10}$, as in Sec. 49, Part I.

Uses.—Platinum is employed in trituration by homœopathic physicians in functional disorders of the uterus and ovaries with hysterical depression of spirits, nervous sleeplessness, flatulence, and constipation as prominent symptoms.

The ehloride and iodide resemble auric chloride and the mercuric salts in their action, and have been used as remedies in constitutional forms of syphilis. The chloride of sodium and platinum is especially recommended in primary forms of syphilis, and in one per cent. solutions as an injection in gonorrhœa, gleet, and as an application to indolent ulcers.

All these salts are very poisonous, and must be used in minute doses only, guarding against irritation of the stomach, headache, etc.

Dose.—Platinum in trituration, $\frac{N}{10}$ to $\frac{N}{103}$.

Platinic iodide in trituration, $\frac{N}{10}$ to $\frac{N}{103}$.

Platinic chloride solution, $\frac{N}{10}$, gtt. j. to v. = gm. 0.06 to 0.33.

Sodium and platinum ehloride solution, $\frac{N}{10}$, gtt. ij. to x. = gm. 0.13 to 0.66.

PLUMBI ACETAS, $\text{PbC}_2\text{H}_3\text{O}_2 \cdot 3\text{H}_2\text{O}$. M. wt. 379.**Acetate of Lead.**

The pure salt in colorless prisms, containing 14.2 per cent. of water of crystallization, freely soluble in water, partially in alcohol.

PLUMBI CARBONAS, $2\text{PbCO}_3 \cdot \text{Pb}_2\text{HO}$. M. wt. 775.**Carbonate of Lead.**

The commercial pure carbonate of lead in heavy, white, pulverulent masses, insoluble in alcohol and water, but soluble without residue in nitric and acetic acids.

PLUMBI IODIDUM, PbI_2 . M. wt. 461. Iodide of Lead.

The pure salt in bright yellow powder, specific gravity 6.1, very slightly soluble in cold water, soluble in ammonium chloride, solutions of iodides and acetates, and in boiling water (187 parts).

PLUMBI NITRAS, Pb_2NO_3 . M. wt. 331. Nitrate of Lead.

The pure salt in white crystals, specific gravity 4.4, soluble freely in water and alcohol, and containing 62.5 per cent. of lead.

PLUMBI OXIDUM, PbO. M. wt. 223. Oxide of Lead.

Commercial litharge, as a more or less crystalline powder, composed of scales of varying size, specific gravity 9.3, reddish-yellow color, soluble without residue in nitric acid, and containing 92.82 per cent. of lead.

Uses.—The acetate of lead is the only one of the foregoing salts of lead which is commonly used internally, and its utility may be considered at best questionable. It is employed as styptic in hæmoptysis, and to control diarrhœa and dysentery when not acute, or after subsidence of febrile symptoms; also to restrain excessive sweating and secretion of chronic bronchitis and whooping-cough. Externally, it is usually employed as solution of subacetate, which see.

Dose.—As a styptic, grs. j. to ij. = gm. 0.06 to 0.66. In other cases, grs. $\frac{1}{10}$ to j. = gm. 0.006 to 0.06.

Carbonate of lead is applied in powder to irritated surfaces of skin and in ointment to burns, but should never be used on the unbroken skin.

Iodide of lead is employed locally in ointment, $\frac{N}{10}$, made with simple cerate, for glandular enlargements.

Nitrate of lead is useful occasionally in solution as a deodorizer for offensive discharging surfaces or ulcers. A $\frac{N}{100}$ solution is of proper strength.

Oxide of lead is occasionally employed like carbonate, but is principally of use for the preparations of lead.

PODOPHYLLUM PELTATUM. May Apple.

The dried rhizome.

Berberidaceæ.

Linné. Bentley and Trimen.

Constituents.—The most interesting substance, from a medical standpoint, obtained from this drug is the resinous principle (*Resina Podophylli*), commercially known as Podophyllin. This body consists of a resin, soluble, and a glucoside, insoluble, in ether, the former being the active purgative portion. Podophyllin of two varieties are found in the shops, one being greenish-yellow, the other grayish-white with a tinge of yellow. The greenish-yellow variety is rendered so by using alum in the water used for precipitation, the other being prepared by a similar use of muriatic acid; the yellow variety is more soluble in ether, although no appreciable difference between the two has been detected when used medicinally.

Recent careful analysis of podophyllin indicates the presence of a

substance called *podophyllo-toxin*, which is freely soluble in alcohol and chloroform, slightly in water, insoluble in benzine, of white color, difficultly crystallizable, readily fusible, of bitter taste, and great activity. It is considered a compound of a non-active acid, podophyllinic acid, with a crystallizable substance called picropodophyllin. The root also contains green, fatty oils, a substance crystallizing in yellow needles, considered identical with quercitin and a crystalline fatty acid. The podophyllo-toxin is considered the active principle of the root.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A resin (Resin Podophylli or Podophyllin), with alcohol, as in Sec. 27, Part I., adding to the water used for precipitation one part of hydrochloric acid for each 100 parts of drug treated.

A trituration, $\frac{N}{10}$ to $\frac{N}{100}$, of Podophyllin, as in Sec. 49, Part I.

Uses.—This drug exhibits a marked affinity for the small intestines, though it influences the entire alimentary tract, its glandular apparatus and associated viscera. In large doses it is a powerful irritant to the mucous tissues with which it may come in contact, and, after absorption into the circulation, it is eliminated by the glands, which it stimulates or even inflames. Medicinally, it is a valuable remedy when there exists impairment of the sympathetic innervation, indicated by fulness and pasty coat of the tongue, portal engorgement with a tendency to hemorrhoids, hypogastric pain, and feeling of weight, sluggish, venous circulation, shown by fulness of superficial veins, constipation from want of sensibility of rectal mucous membrane, jaundice, urine scanty, dull, pressive headache, with soreness of the eyeballs, especially on waking in the morning.

In brief, in states of functional torpor of the portal system, or of tissues or organs in vascular or nervous connection therewith, this drug, properly used, will be found curative. This state does not require purgation, but stimulation, and the dose should be carefully regulated, that the irritant effects of the drug do not appear; in these cases its local influence on the mucous surfaces doubtless induces reflex stimulant impressions upon associated tissues and viscera. There are irritable conditions of the gastro-intestinal tract, causing diarrhœa of profuse, watery, offensive stools, with severe cutting pains, or dysentery, with a mucous or bloody discharge of bad odor, and accompanied with much pain and prolapsus ani, or a tendency thereto; in such cases very minute doses of triturerated podophyllin will be found curative, acting not locally, but after absorption.

Dose.—In states of torpor, tincture $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to

1.00, or equivalent, or podophyllin, trit. $\frac{N}{10}$, grs. $\frac{1}{2}$ to ij. = gm. 0.03 to 0.13. In irritable conditions, podophyllin, trit. $\frac{N}{103}$, grs. $\frac{1}{2}$ to ij. = gm. 0.03 to 0.13.

POLEMONIUM REPTANS. Greek Valerian.

The fresh root.

Polemoniaceæ.

Constituents.—The drug has not been analyzed.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—The useful applications of the drug are not clearly defined. It influences the skin, increasing its functional activity, and may be employed whenever such action is desired. It deserves investigation.

Dose.—Tincture, $\frac{N}{1}$, gtt. xv. to xxx. = gm. 1.00 to 2.00, or equivalent, in warm water or tea.

POLYGONUM PUNCTATUM. Water Pepper.

The fresh plant in flower.

Polygonææ.

Constituents.—The plant possesses an acrid, pungent taste, which is lost by drying, indicating a principle which is volatile or easily destroyed; it contains tannin, amounting to 18 per cent.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This drug directly influences the pelvic viscera, including the reproductive and urinary organs; it also increases the activity of the skin, and stimulates the mucous coats and nerve supply of the gastrointestinal canal. It is a useful agent to promote the menstrual flow in cases of amenorrhœa when due to atony, or when the arrest is from cold. In dysentery and watery mucous diarrhœa, with tormina and tenesmus, it is often a very efficient remedy.

Dose.—Tincture, $\frac{N}{1}$, gtt. xv. to 3ss. = gm. 1.00 to 2.00, or equivalent.

POLYMNIA UVEDALIA. Bearsfoot.

The recent root.

Compositæ, Senecionidæ.

Linné.

Constituents.—No complete analysis is recorded. The root contains two *acrid resinous bodies*, soluble in alcohol, ether, and chloroform, one

of which is hard, the other soft and balsamic. Tannin and an odorous principle are also present.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

An ointment, as follows:

Take of Tincture, $\frac{N}{I}$, one part	1
Lard, two parts	2

Heat together until vapor ceases to escape.

Uses.—Polymnia has been strongly urged as a remedy in conditions characterized by vascular atony, functional impairment, especially of glands which are enlarged, painful, or inflamed, or, in common with the tissues generally, are sodden, flabby, and non-elastic. In splenic enlargement of malarial origin, it seems to have proved useful. It is given internally, and used locally in ointment, the latter well rubbed in with heat.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

POLYPODIUM VULGARE. Polypody.

The fresh root.

Filices, Polypodiaceæ.

Constituents.—No analysis of this plant is recorded.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Suggested for further study in connection with pulmonary disorders with cough, difficult breathing, asthma, and bronchial catarrh; also in gastric disorders, especially when associated with cutaneous eruptions.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

POLYTRICHUM JUNIPERINUM. Hair-cap Moss.

The fresh plant.

Constituents.—No analysis has been made.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Hair-cap moss is powerfully diuretic and will be found useful when such an influence is desired.

Dose.—Tincture, $\frac{N}{I}$, gtt. xxx. to 3j. = gm. 2.00 to 4.00, or equivalent, well diluted, and repeated every half to one hour.

POPULUS TREMULOIDES. Aspen Poplar.

The fresh bark.

Michaux.

Constituents.—*Populin* and *salicin* are given as constituents of the drug, and doubtless represent all that are of medical interest.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Long used as a domestic remedy for intermittent fevers, in which it is sometimes efficacious. Its influence is especially on the digestive organs and the genito-urinary tract. In indigestion, characterized by acidity and flatulence, it is of marked value, and in disorders of the urinary organs, when vesical tenesmus is the most prominent symptom, it is often promptly curative.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

POTASSA, KHO. M. wt. 56. Hydrate of Potassium.

The fused hydrate, containing at least 90 per cent. pure hydrate in dry, white, cylindrical sticks, which are brittle, but rapidly deliquesce, and combine with carbonic acid gas when exposed to the air. Its solution has a strong alkaline reaction, soapy feel, and burning taste. When dissolved in one-third its weight of water it crystallizes on cooling, the crystals containing 60.86 per cent. of potassium hydrate (KHO) and 39.13 per cent. of water (H₂O).

Solubility.—Soluble in less than its own weight of water, in alcohol, and slightly in ether.

Tests.—*Foreign salts*; residue or turbidity when 1 part of hydrate is dissolved in 50 parts of alcohol. Carbonates, nitrates, chlorides, and sulphates of potassium, with salts of ammonium, are liable to be present in the commercial caustic potash; but, unless gray or greenish in color, or a marked residue is left on treatment with alcohol, it is pure enough for medical uses.

Preparations.—A solution, *Liquor Potassæ*, $\frac{N}{20}$, as follows:

Take of Hydrate of potassium, 90 per cent. pure, <i>fifty-six parts</i> . . .	56
Water sufficient to make <i>one thousand parts</i>	1000

Dissolve the potassa in the water, allow the solution to stand until all sediment subsides, and decant the clear liquid for use; keep in well-stopped green glass bottles. Its specific gravity is 1.036 = 5 per cent. KHO. An aqueous solution containing 10 per cent. of its weight of

potassa is used, variously diluted, by homœopathic physicians, under the name of Kali causticum. 20 parts of Liq. potassæ, $\frac{N}{20}$, with water sufficient to make 100 parts, would make a one per cent. solution ($\frac{N}{100}$, or 2^x). [U. S. P.]

Uses.—Chiefly used as a caustic for its solvent and destructive action upon nitrogenous tissue, for the water of which it has a strong affinity. Owing to its affinity for water and the high diffusive power of this caustic, its action must be carefully guarded and controlled to prevent the destruction of an unnecessary amount of structure. This may be effected by neutralizing it with vinegar and water when its action has sufficiently extended. To destroy warty growths or the hard edges of sluggish sores, or to open abscesses, this caustic will be found convenient. Internally, it is rarely employed. It promotes retrograde metamorphosis, diminishes the coagulability of the blood, increases the urine, rendering it less acid, and causes general emaciation. It is questionable whether this power should ever be invoked.

POTASSA CUM CALCE. Potassa with Lime.

A grayish-white powder, of strong alkaline reaction and caustic taste, readily absorbing water and carbonic-acid gas from the air when exposed, for which reason it should be kept in well-stopped bottles. It is composed of equal parts of potassa and fresh lime powdered together.

Uses.—This is used as a milder form of caustic than pure potassa, and in similar cases.

For use, reduce to a paste with alcohol. This, as well as pure potassa, may be mitigated by fusion with gutta-percha in any proportion desired.

POTASSII ACETAS, $KC_2H_3O_2$. M. wt. 98. Acetate of Potassium.

The pure salt, as a white, granular powder, or soft mass of satiny, crystalline appearance, slight odor of acetic acid, and very deliquescent on exposure to the air.

Solubility.—Freely soluble in water ($\frac{1}{2}$ part) and alcohol (3 parts).

Tests.—*Metals*; precipitate or turbidity in a solution on addition of solution of ammonium sulphide, hydrogen sulphide, or potassium ferrocy-anide. *Sulphates or carbonates*; white precipitate with solution of barium chloride. *Chlorides*; white precipitate on adding solution of silver nitrate to solution of the salt acidulated with nitric acid. *Carbonates*; effervescence on adding acetic acid to concentrated solution.

Uses.—This salt is employed chiefly for its power to promote the dis-

integration and excretion by the kidneys of effete matters; with this view it is used in rheumatism of the acute articular form, and when boils, carbuncles, or cutaneous eruptions indicate the presence in the system of matters which should be excreted. It is often valuable in dropsy following scarlatina, in ascites of hepatic origin, and occasionally in cardiac and splenic dropsies. In certain congestions of the spleen, uterus, liver, and portal circle, it is of marked value.

Dose.—As a diuretic, and in febrile conditions, grs. x. = gm. 0.66, largely diluted. In rheumatism, or as an alterative, grs. xxx. = gm. 2.00, every three or four hours.

POTASSII BICARBONAS, KHCO_3 . M. wt. 100. Bicarbonate of Potassium.

The pure salt, in colorless, transparent crystals, of saline, slightly alkaline taste, free from causticity. 50 parts, when heated to low redness, yield 34.5 parts of carbonate of potassium (K_2CO_3).

Solubility.—Freely soluble in water, nearly insoluble in alcohol.

Tests.—*Metallic salts*; dark precipitate on adding sulphuretted hydrogen. *Chlorides*; white precipitate on adding solution of nitrate of silver to a solution of the salt acidulated with nitric acid. *Sulphates*; white precipitate with barium nitrate when added to a solution of previous test. *Carbonate of potassium*; deliquescence on exposure to air, or white precipitate when solution is mixed with solution of sulphate of magnesium. *Sodium salts*; yellow color of flame when a portion is heated strongly in blowpipe flame.

Uses.—When from sedentary habits, excess at the table, or chronic malarial poisoning, there exists engorgement of the liver, indigestion with excessive formation of acid, constipation, scanty urine, containing uric acid, with the irritability of the bladder and nervous system which this latter substance causes, the judicious use of bicarbonate of potassium will render secretions more liquid, increase the alkalinity of the blood, promote the elimination of uric acid, and the oxidation and excretion of effete matters. This salt has been much used in acute rheumatism, but the best observers, while conceding that it will mitigate the pain, question the shortening or control of the fever.

Dose.—In acid dyspepsia, grs. xv. to xxx. = gm. 1.00 to 2.00, dissolved in a large quantity of water, and taken during or after meals; when acidity arises from fermentation of food, give before eating.

POTASSII BICHROMAS, $K_2Cr_2O_7$. M. wt. 295. Bichromate of Potassium.

The pure salt, in transparent, red, four-sided prisms or plates.

Solubility.—Insoluble in alcohol, soluble in water (10 parts).

Tests.—*Sulphates*; white precipitate on addition of barium chloride to a solution of the salt acidulated with nitric acid. *Calcium salt*; precipitate on adding potassium carbonate.

Preparations.—An aqueous solution. Potass. Bich. *Liq.*, $\frac{N}{100}$, as follows:

Take of Bichromate of potassium, <i>one part</i>	.	.	.	.	.	1
Water, <i>ninety-nine parts</i>	.	.	.	.	.	99

Dissolve.

A trituration, $\frac{N}{10}$, as in Sec. 49, Part I.

Uses.—This salt is employed in a similar manner to chromic acid when an escharotic action is required of less intensity than that caused by that substance. Internally, it is an antiseptic of great power, and is indicated when there is fetor of the breath and excretions, sordes on the teeth, and tenacity of the secretions of the mouth, or dryness, with a tendency to bleeding of the mucous surfaces, as in typhoid conditions.

Homœopathic physicians employ it in trituration and solution (3^\times to 6^\times), for conditions of the mucous membranes characterized by tenacity and stringiness of the secretions; affections of the respiratory organs with the same toughness of secretion and expectorated matters; ulceration of the mucous surfaces, especially of the throat and nares, with tenacity of secretion, which is sometimes bloody, and in pustular eruptions, and chronic syphilitic or similar ulcers.

Dose.—Trituration, $\frac{N}{10}$, grs. j. to ij. = gm. 0.06 to 0.13. Liquor, $\frac{N}{100}$, gtt. xv. to 3ss. = gm. 1.00 to 2.00 to water, a gobletful; teaspoonful every two to four hours.

For local use the powdered crystal, the trituration, or solution may be used, according to the intensity of action required.

POTASSII BITARTRAS, $KHC_4H_4O_6$. M. wt. 188.
Bitartrate of Potassium.

The pure salt in powder, which is white, of pleasant, acidulous taste, but producing a somewhat gritty sensation when taken in contact with the teeth. When ignited, it should yield 36.7 per cent. of carbonate of potassium (K_2CO_3) as a residue.

Solubility.—Insoluble in alcohol, and but moderately in cold water (200 parts); it dissolves in boiling water (15 parts). Ammonia and potassa solutions dissolve it freely, forming neutral compounds; diluted acids also dissolve it.

Tests.—*Chalk, alum, gypsum, starch, etc.*; incomplete solubility in solution of ammonium hydrate. *Iron, copper, etc.*; precipitate by sulphuretted hydrogen from solution in ammonium hydrate. *Calcium salts*; precipitate from same by oxalate of ammonium.

Uses.—This salt is principally employed as a diuretic and refrigerant to moderate excitement of the vascular system in fevers. It is also often associated with purgatives to assist their action, as with jalap, sulphur, magnesia, etc.

Dose.—For refrigerant and diuretic influence, dissolve ʒj. to ʒij. = gm. 4.00 to 8.00, in a goblet of water or lemonade, and use ad libitum as a drink.

Doses of ʒss. to ʒj. = gm. 32.00 to 64.00 produce purgation; but, as excessive doses may act poisonously, by causing gastro-intestinal irritation, they should be employed with caution.

POTASSII BROMIDUM, KBr. M. wt. 119. Bromide of Potassium.

The pure salt in colorless cubical crystals, which are semi-transparent, of specific gravity 2.415, and form a neutral solution when dissolved. Commercial bromide of potassium is often in white crystals, which have been obtained from an alkaline solution, and have, therefore, slightly alkaline reaction. One part of the salt should dissolve to a colorless liquid in 20 parts diluted sulphuric acid, specific gravity 1.115.

Solubility.—Soluble in cold water (3 parts), and in boiling (1 part); slightly soluble in alcohol (200 parts).

Tests.—*Potass. carb.*; white turbidity on adding a concentrated solution to lime water. *Sulphates*; white precipitate on adding solution of barium nitrate to a solution of the salt acidulated with a few drops of nitric acid. *Potass. bromate*; reddish color of solution on addition of concentrated pure hydrochloric acid. *Chlorides*; precipitate a small amount of solution with excess of nitrate of silver, filter, treat the precipitate with aqua ammoniæ, again filter, and add excess of nitric acid; a white precipitate will indicate chlorides. *Iodides*; blue color on adding a few drops of chlorine water and a little cold decoction of starch. Bromide, if pure, produces a yellow color.

Uses.—This salt limits the supply of the blood to the brain and cord,

by contracting the smallest blood-vessels and capillaries; this causes a direct limitation of nutrition and consequent depression of functional excitability of these organs. Both the reflex function of the cord and that of the sensory nerves are diminished by it; owing to these properties it has many uses, the most prominent of which are to control sleeplessness or restlessness due to nervous erethism, excitement of the sexual organs, epilepsy with irritability of the same, spasms and convulsions in infants or adults, when caused by exaltation of the reflex function of the cord or by cerebral hyperæmia, etc. Its excessive use is hurtful, by impairing the nutrition of the brain and nerve centres.

Dose.—One grain = gm. 0.06 for each year of age of patient up to 20. It should be given well diluted, and may be repeated every hour, if required, until its specific effects appear.

POTASSII CARBONAS, K_2CO_3 . M. wt. 138.

Carbonate of Potassium.

The pure salt in white, granular powder, which is quite deliquescent in moist air, and soluble to a limpid liquid in an equal weight of water.

Solubility.—Soluble in water (one part), and insoluble in alcohol.

Tests.—*Silicic acid*; gelatinous precipitate on over-saturating its solution with nitric acid. *Chlorides*; white precipitate from preceding solution after filtering on addition of solution of silver nitrate. *Sulphates*; white precipitate from same on adding solution of barium nitrate. *Metals*; dark precipitate or coloration on adding sulphuretted hydrogen solution to a solution of the salt, divided between two test tubes, one portion of which has been over-saturated with nitric acid. *Nitrates*; brownish coloration on adding to a solution a little ferrous sulphate, and afterwards some strong sulphuric acid.

Uses.—The action of this substance, used internally, may be considered identical with that of bicarbonate of potassium, though a stronger alkali, and having more the properties of a caustic and irritant.

Powdered in dry atmosphere, and tempered by mixture, with an equal weight of powdered bicarbonate of potassium, it forms an excellent, mild, caustic application to fungous granulations, scrofulous and fistulous ulcers and morbid growths. This mixture, or its equivalent, was formerly sold as (so-called) sesqui-carbonate of potash.

Dose.—Grs. v. to xv. = gm. 0.33 to 1.00, dissolved in water to make a pleasant alkaline drink.

POTASSII CHLORAS, KClO_3 . M. wt. 122.5. Chlorate of Potassium.

The pure salt in colorless, pearly, rhomboidal plates, of a cooling, saline taste, and specific gravity 2.35. Mixtures of this salt with readily oxidized substances, such as sugar, tannin, sulphur, or organic matters, explode when triturated in the dry state. It evolves explosive gases with strong sulphuric (chloric peroxide, Cl_2O_4), or hydrochloric acid (euchlorine or chloro-chloric acid [$\text{Cl}_2\text{O}_3(\text{Cl}_2\text{O}_5)$]). The former explodes when slightly heated into oxygen and chlorine; euchlorine dissolved in water separates into chlorine and chloric peroxide.

Solubility.—Soluble in water (17 parts), and slightly in alcohol (120 parts).

Tests.—*Sulphate*; white precipitate from aqueous solution on addition of barium chloride. *Chloride*; white precipitate on adding solution of nitrate of silver. *Salts of calcium*; white precipitate on adding solution of ammonium oxalate. *Nitrate*; red precipitate on adding solution of mercuric chloride to solution of residue left after heating chlorate to full redness.

Uses.—Used as an antiseptic and deodorizer when the breath and secretions are fetid, having the odor of decomposing animal matter. In typhoid and the puerperal state it will be found very reliable, used internally and as a wash. A custom of giving saturated solutions internally in diphtheria has been much in vogue, but experience has proven not only the unreliability but the positive danger of the procedure. All the good to be done in that disease is from the local action of the drug when applied topically or by atomizer, or its internal use in small doses as a preventive. It is very useful, locally applied, in curing stomatitis, whether ulcerative, gangrenous, or follicular, as well as in other forms of ulcers, sore throat, or salivation.

Dose.—Grs. v. to ʒij. = gm. 0.33 to 8.00, in twenty-four hours.

POTASSII CITRAS, $\text{K}_3\text{C}_6\text{H}_5\text{O}_7 \cdot \text{H}_2\text{O}$. M. wt. 324. Citrate of Potassium.

The salt in white, granular, deliquescent powder, which dissolved forms a neutral solution of slightly alkaline or saline taste.

Solubility.—Freely soluble in water, insoluble in very strong alcohol.

Tests.—*Carbonate*; effervescence on addition of acetic acid to a solution of the salt. *Tartrate*; crystalline precipitate on adding acetic acid to solution.

Uses.—In an extemporized form, made by adding bicarbonate of

potassium to strained lemon juice, as long as it effervesces, it is useful in febrile conditions to promote the activity of skin and kidneys, and to render alkaline an excessively acid urine.

The granular salt is similarly used.

Dose.—Grs. xv. to ʒj. = gm. 1.00 to 4.00.

POTASSII CYANIDUM, KCN. M. wt. 65. **Cyanide of Potassium.**

The commercial salt in fused fragments of a pure white color, inodorous when dry, but evolving the odor of hydrocyanic acid when exposed to the moisture and carbonic-acid gas of the air. Its reaction, when dissolved, is alkaline, its taste pungent and bitter, with a sensation of coldness followed by irritation and constriction of the fauces. The commercial salt usually contains cyanate of potassium (KCNO) as an impurity. It should contain not less than 90 per cent. of pure cyanide of potassium.

Uses.—This excessively poisonous compound has but limited usefulness as a medicine. It has been employed locally to seat of pain in lotion for the relief of reflex headaches arising from gastric, pulmonary, or menstrual derangement. It is applied on a compress moistened with a solution containing grs. ij. to iv. = gm. 0.13 to 0.25 to water ʒj. = gm. 32.00. The application should be suspended as soon as the pain declines.

This solution is occasionally useful to allay the troublesome itching of lichen, prurigo, and pruritus pudendi. These, with its employment to remove stains made by nitrate of silver, are all its useful applications.

POTASSII ET SODII TARTRAS, KNaC₄H₄O₆.4H₂O. M. wt. 282.
Tartrate of Potassium and Sodium.

The pure salt in white powder, or transparent, six- or eight-sided prisms or half prisms, efflorescent in dry air, and of mild saline taste.

Solubility.—Soluble in water (2 parts). Alcohol dissolves but traces of the salt.

Tests.—It should dissolve to a clear neutral solution with water. *Sulphates*; white precipitate, insoluble in nitric acid on adding barium nitrate to its solution. *Chlorides*; white precipitate, insoluble in nitric acid on adding nitrate of silver to the solution. *Calcium salt*; white precipitate or turbidity with solution of oxalate of ammonium added to solution of the salt.

Uses.—Used as a mild, cooling aperient, particularly acceptable to sensitive stomachs. 160 grains = gm. 10.50 of a mixture of 3 parts of

tartrate of potassium and sodium and 1 part of bicarbonate of sodium, forms the contents of the blue paper of the ordinary seidlitz powder, the white paper containing 35 grains = gm. 2.27 of tartaric acid.

Dose.— $\bar{3}$ ss. to $\bar{3}$ j. = gm. 16.00 to 32.00, according as an aperient or purgative action is wanted.

POTASSII FERROCYANIDUM, $K_4FeC_6N_6 \cdot 3H_2O$. M. wt. 422.
Ferrocyanide of Potassium.

The pure salt in tabular, transparent, yellow crystals, permanent in the air, mild, rather sweetish saline taste, and specific gravity 1.83.

Solubility.—Soluble in water (4 parts), insoluble in alcohol.

Tests.—*Chlorides*; fuse one part of the salt with three parts of nitrate of ammonium, dissolve the mass in water, acidify with nitric acid, and add solution of silver nitrate—a white precipitate indicates chlorides. *Carbonates*; effervescence on adding diluted sulphuric acid to the solution. *Sulphates*; white precipitate when barium chloride is added to a solution acidulated with hydrochloric acid.

Uses.—As a reagent for zinc, iron, and copper.

Instability and weakness in the heart's action, irritable states of the nervous system, both seemingly dependent on impoverishment of the blood, are conditions in which the remedy may be successfully employed internally. Headaches, neuralgias, palpitation, vertigo, etc., especially when associated with chronic disease of the reproductive organs of women, are often cured by the use of the drug. The nervous states incident to hypochondriasis, hysteria, and "change of life," seem to especially come under its influence.

Dose.— $\bar{3}$ j. to $\bar{3}$ ss. = gm. 4.00 to 16.00 dissolved in water $\bar{3}$ iv. = gm. 128.00. Teaspoonful doses every two to four hours.

POTASSII HYPOPHOSPHIS, KPH_2O_2 . M. wt. 104.
Hypophosphite of Potassium.

The pure salt in opaque, white, deliquescent, crystalline masses.

Solubility.—Freely soluble in water and diluted alcohol; less soluble in alcohol or absolute alcohol; insoluble in ether.

Tests.—*Phosphates*; white precipitate on adding solution of chloride of magnesium and ammonium, and a small amount of ammonium hydrate. *Sulphate*; white precipitate with solution of barium chloride, insoluble in hydrochloric acid. *Carbonates*; effervescence on addition of diluted acids. If none of the foregoing foreign matters are present,

and the salt is completely soluble in water and diluted alcohol, it is sufficiently pure for medicinal use.

Uses.—This is a useful remedy in conditions characterized by muscular debility, myalgia, and wasting of muscular tissue, all dependent on impaired innervation. This condition often results from loss of fluids, as in undue lactation, loss of semen, profuse expectoration, etc. Chronic bronchitis, with severe myalgic pains of thoracic muscles, presents the conditions for its use.

Dose.—Grs. $\frac{1}{6}$ to 1 = gm. 0.006 to 0.06, two to four times a day, preferably in solution. It is a constituent of a compound syrup in common use. (See *Calcii Hypophos.*)

POTASSII IODIDUM, KI. M. wt. 166. Iodide of Potassium.

The pure salt in translucent crystals, of peculiar odor, pungent, saline taste, of specific gravity 2.9, fusible below red heat, and slightly deliquescent in moist air.

Solubility.—Freely soluble in water ($\frac{2}{3}$ of 1 part), and in alcohol, of specific gravity 0.835 ($6\frac{1}{2}$ parts).

Tests.—*Admixtures or impurities*; turbidity or crystalline deposit on adding $1\frac{1}{2}$ fluidounces of alcohol to a solution of 1 drachm of iodide in 1 fluidrachm of water. *Potassium iodate*; violet coloration on adding to a solution a few drops of mucilage of starch followed by a few drops of a concentrated solution of tartaric acid.

Uses.—The most marked benefits of this remedy are apparent in cases where there exists periosteal thickening, with infiltration of neighboring tissue, hypertrophy of glands, with or without induration, inflammatory effusion or thickening of organs, and paralysis, or lesions of sensibility, especially characterized by nocturnal pain. Its efficacy seems due to its power of promoting absorption of effusions or indurations which compress nerve trunks or centres; these cases may be rheumatic, mercurial, saturnine, or syphilitic in origin, the nocturnal pains being usually considered as indicative of the latter.

In addition to this power it promotes waste and increases the activity of skin, kidneys, and mucous membranes, and is often employed with good results in diseases of these tissues.

Dose.—Grs. ij. to xv. = gm 0.13 to 1.00, largely diluted.

POTASSII NITRAS, KNO_3 . M. wt. 101. Nitrate of Potassium.

The pure salt in prismatic, six-sided, transparent, colorless crystals, or in granular white powder, of specific gravity 2.0.

Solubility.—Soluble in water (about 5 parts). It is far more soluble in boiling water, less so in glycerine or diluted alcohol, insoluble in alcohol.

Tests.—*Sulphates*; white precipitate on addition of barium nitrate to a diluted solution acidulated with nitric acid. *Chlorides*; white precipitate on adding nitrate of silver to dilute solution acidulated with nitric acid. *Sodium nitrates*; white crystalline precipitate by addition of a few drops of solution of antimoniate of potassium to a cold concentrated solution of the salt. *Calcium salts*; white turbidity on adding ammonia and ammonium oxalate to a solution of the salt. *Magnesium salts*; white crystalline precipitate on addition of ammonia and phosphate of sodium to a solution of the salt.

Uses.—Useful in influenza, acute and chronic rheumatism, and lumbago when the urine is scanty, high colored, becomes turbid on cooling from deposition of urates, or forms, on cooling, after mixture with an equal bulk of nitric acid, a mass of crystals of nitrate of urea.

Dose.—Grs. v. to x. = gm. 0.33 to 0.66, dissolved in water, every one or two hours, until the urine becomes normal in appearance and amount of urea.

POTASSII PERMANGANAS, $K_2Mn_2O_8$. M. wt. 316. Permanganate of Potassium.

The salt in dark-purple, prismatic crystals, without odor, and of sweet, somewhat astringent taste.

Solubility.—Soluble in water (16 parts), insoluble in alcohol or chloroform.

Tests.—If an aqueous solution of 5 grains of the salt is completely decolorized by mixing it with a solution of 44 grains of pure ferrous sulphate acidulated with 2 fluidrachms of diluted sulphuric acid, then the salt may be considered pure.

Uses.—Permanganate of potassium readily yields its oxygen to organic matters and to inorganic reducing-agents, such as subsalts of the metals, oxalic, sulphurous, and hydrosulphuric acids; it therefore reacts violently with many substances and should be used only in aqueous solution. The medical applications of this salt are due to the readiness with which it yields up its oxygen. It is employed locally to correct fetor of gangrenous ulcers, cancer, caries, ozæna, and foul discharges, as lochia, leucorrhœa, otorrhœa, etc. It stimulates mucous surfaces and the skin when they lack vitality, are inclined to slough, or when inflammation threatens; and it has been thus usefully applied in

phlegmonous erysipelas, the early stages of felons, boils, etc. It is given internally in conditions where increased oxidation seems demanded.

Dose.—Internally, grs. j. to v. = gm. 0.06 to 0.33, dissolved in large amount of water; locally, 3j. = gm. 4.00 to water Oj. = (512.00).

POTASSII PHOSPHAS, K_2HPO_4 . M. wt. 174. Phosphate of Potassium.

The salt in a white, amorphous mass, deliquescent in the air, and of saline taste.

Solubility.—Freely soluble in water and diluted alcohol.

Uses.—This salt is analogous in its action to hypophosphite of potassium, although not as active. It will prove useful in similar cases. As a restorative in muscular weakness following severe illness, it is preferred to other phosphates.

Dose.—Grs. ij. to v. = gm. 0.06 to 0.33, in solution.

POTASSII SULPHAS, K_2SO_4 . M. wt. 174. Sulphate of Potassium.

The pure salt in colorless, transparent prisms, terminated by six-sided pyramids, or in anhydrous, white, granular powder, of specific gravity 2.66, and bitter, saline taste.

Solubility.—Soluble in water (12 parts), insoluble in alcohol.

Tests.—*Metals*; dark coloration or turbidity on addition of excess of hydrosulphuric acid, and subsequent acidulation with hydrochloric acid. *Sodium*; precipitate from concentrated solution with antimoniate of potassium. *Calcium*; precipitate with oxalate of ammonium solution. *Chlorides*; precipitate from solution acidulated with nitric acid on addition of nitrate of silver.

Uses.—This drug has been employed as a saline purgative. In small doses it is useful in scaly diseases of the epidermis following an exudation of pus-like moisture, and in catarrhal conditions of mucous surfaces when the secretion is viscid and yellowish. In duodenal and gastric catarrh, when the tongue is coated with yellow mucus, it is often curative.

Dose.—Grs. j. to x. = gm. 0.06 to 0.66, in water, three times a day.

POTASSII SULPHIDUM. Sulphide of Potassium.

The commercial compound, which is usually a mixture in variable proportions of the higher sulphides of potassium (K_2S_4 and K_2S_5),

sulphite (K_2SO_3), hyposulphite ($K_2S_2O_3$), and sulphate (K_2SO_4), with occasionally carbonate of potassium (K_2CO_3) and sulphur, the last two substances being left in process of manufacture. Owing to this indefinite composition, it is sometimes called sulphurated potash (Potassa Sulphurata, U. S. P.).

Solubility.—Soluble in water (3 or 4 parts). Rectified spirits should dissolve three-fourths of the weight of the freshly-prepared compound.

Uses.—This substance, which has a strong odor of sulphuretted hydrogen, is used principally for local treatment of acne, psoriasis, and discharges of a purulent character from nostrils, vagina, etc. It is employed in ointment or by bath, usually the latter, in the proportion of $\frac{3}{4}$ ij. to the full bath. Internally, as well as locally, it has proven useful in chronic lead poisoning and eruptive diseases. In general, it may be stated that strong solutions excite inflammation in the skin, and weak ones stimulate it. Internally, it tends to prevent or control supuration (see *Calcium Sulphide*), and doubtless influences skin and mucous surfaces in the same manner, but more actively than potassium sulphate.

Dose.—Grs. $\frac{1}{2}$ to v. = gm. 0.03 to 0.33, largely diluted.

POTASSII SULPHIS, $K_2SO_3 \cdot 2H_2O$. M. wt. 194.

Sulphite of Potassium.

The salt in oblique, octahedral, rhombic crystals, somewhat deliquescent, or more commonly as an opaque white powder of bitter saline taste.

Solubility.—Soluble freely in water, sparingly in alcohol.

Tests.—*Sulphate*; white precipitate, insoluble in hydrochloric acid on adding solution of barium chloride.

Uses.—This salt is supposed to possess the same anti-fermentative and anti-putrefactive power as the sulphite of soda, and has been similarly used, though rarely. It probably possesses similar medicinal virtues with the sulphate when taken internally, as it is converted into that salt by oxidation.

Dose.—Grs. ij. to x. = gm. 0.13 to 0.66, in water, every two hours.

POTASSII TARTRAS, $(K_2C_4H_4O_6)_2H_2O$. M. wt. 470.

Tartrate of Potassium.

The salt in colorless, transparent, irregular, six-sided prisms, or in granular white powder of saline taste, and slightly deliquescent.

Solubility.—Freely soluble in water, sparingly in alcohol.

Tests.—*Metals*; colored precipitates or turbidity with sulphide of ammonium. *Chlorides*; white precipitate, insoluble in nitric acid with nitrate of silver. *Sulphates*; white precipitate, insoluble in nitric acid with nitrate of barium. *Carbonate*; white precipitate with solution of calcium chloride. *Bitartrate*; acid reaction on litmus paper. *Sodium salts*; white crystalline deposit on adding an equal volume of solution of antimoniate of potassium to a solution of the carbonate remaining after ignition of a portion of the salt in a crucible.

Uses.—Used as a mild saline laxative, or in smaller doses, diluted, as a diuretic. It is analogous in action and uses to potass. et sodii tartras (which see).

Dose.—Grs. x. to ʒss. = gm. 0.66 to 16.00, in solution, well diluted.

POTENTILLA CANADENSIS. Five Finger.

The fresh plant in flower.

Rosaceæ, Dryadæ.

Linné.

Constituents.—*Tannin* in small amount, *mucilage*, and bitter matters with common vegetable principles.

Preparations.—A tincture, $\frac{N}{4}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This is a feeble agent, but is occasionally useful in relaxed and catarrhal conditions of mucous surfaces, passive hemorrhages, sore throat, and to control night sweats.

Dose.—Usually in decoction, $\frac{N}{10}$ (Sec. 18, Part I.), in tablespoonful doses (gm. 16.00), or locally as a wash or gargle.

Tincture, $\frac{N}{1}$, gtt. x. to ʒj. = gm. 0.66 to 4.00, or equivalent.

P. Reptans, *P. Argentea*, and *P. Palustris*, may be prepared and employed in the same manner and dose.

PRENANTHES ALBA. Rattlesnake Root.

The fresh plant. (*Nabalus Albus. Hooker.*)

Compositæ, Ligulifloræ.

Linné.

Constituents.—The plant has not been analyzed.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—The uses of this drug are not well defined.

It is in use as a domestic tonic on account of its bitterness, and, as

its name indicates, it is reputed to antidote the poison of the rattlesnake, for which its milky juice is taken internally, and a decoction applied locally.

These statements require verification, but the drug deserves investigation.

The tinctures will prove a convenient form for experimental use.

PRIMULA OFFICINALIS. Primrose.

The fresh plant in flower. (P. Veris. Linné.)

Primulaceæ.

Jaquin.

Constituents.—A solid *volatile oil*, in small amount, an *acrid principle*, probably identical with saponin, a *bitter substance*, and *primulin*, said to be identical with mannit, are the important constituents.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—These are not well defined. The plant has been for many years a popular remedy for the relief of toothache, hemicrania, muscular rheumatism, gout, paralysis, and menstrual pain.

It is probably a vascular stimulant, increasing the activity of skin, mucous surfaces, and kidneys, by means of which its acrid principle is eliminated. Bronchial, gastric, and intestinal disorders, or those of other parts where a capillary engorgement interferes with nervous currents, will probably be benefited by its employment in stimulant doses. It is worth study.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

PRINOS VERTICILLATUS. Black Alder.

The fresh bark. (Ilex Vert. Gray.)

Aquifoliaceæ.

Linné.

Constituents.—*Tannin*, *yellow coloring matter*, and a *bitter principle*; the two latter have not been isolated or identified.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Used to stimulate the processes of assimilation through its influence on the digestive tract. Sores, cutaneous eruptions, and ulcers are benefited by this drug, which improves nutrition generally. It should be carefully studied.

Dose.—Tincture, $\frac{N}{I}$, gtt. x. to xv. = gm. 0.33 to 1.00, or equivalent.

PRUNUS LAURO-CERASUS. Cherry Laurel.

The leaves.

Rosaceæ, Amygdaleæ.

Linné. Bentley and Trimen.

Constituents.—A principle which, in the presence of water and emulsin, decomposes into oil of bitter almonds, hydrocyanic acid, and grape sugar, is found in the leaves of this plant, and by some has been called *amygdalin* ($C_{20}H_{27}NO_{11}$), and by others *laurocerasin* ($C_{40}H_{67}NO_{30}$), the latter being considered a compound of amygdalin, amygdalic acid ($C_{20}H_{26}O_2$), and water ($7H_2O$). Though as yet the real nature of this principle is not clear, the fact remains that the bruised fresh leaves, or the dry leaves after contact with water, give off hydrocyanic acid, which is doubtless a product of the reaction between the natural constituents of the leaves in the presence of the water, and does not exist in them ready formed. *Tannin, wax, fatty matters, and sugar* are also present.

Uses.—This drug is used principally for the preparation, by distillation with water, of cherry laurel water (*Aqua Laurocerasi*) of the British Pharmacopœia. This water is identical in action with hydrocyanic acid, but being of uncertain strength is rarely used in this country.

A tincture, $\frac{N}{2}$, from the fresh leaves, as in Sec. 44, Part I., is suggested for trial in irritable conditions of the gastro-intestinal tract, to control vomiting and irritation when the tongue is pointed and red at the tip and edges.

Dose.—Tincture, $\frac{N}{2}$, gtt. j. to x. = gm. 0.06 to 0.66 in water $\bar{3}$ iv. = gm. 128. A teaspoonful (gm. 4.00) of mixture.

PRUNUS VIRGINIANA. Wild Cherry.

The recent bark collected in autumn. (*Cerasus Serotina. De Condolle.*)

Rosaceæ, Amygdaleæ.

Linné.

Constituents.—*Tannin, gallic acid, and resin* are probably the only active substances present in the dry bark, but by contact with moisture a reaction ensues between two substances, amygdalin and a proteid considered identical with emulsin, which results in the formation of a volatile oil, agreeing in properties with oil of bitter almonds; heat destroys the emulsin, and prevents the formation of the oil. This oil contains hydrocyanic acid, which varies in amount, being greatest in bark collected in autumn.

Preparations.—A tincture, $\frac{N}{1}$, as follows :

Take of Wild cherry bark in coarse powder, <i>thirty-five parts</i>	. 35
Alcohol, <i>seven parts</i>	. . . . . 7
Glycerine, <i>eleven parts</i>	. . . . . 11
Water, <i>seventeen parts</i>	. . . . . 17

Moisten the cherry bark with water sufficient, and macerate in a close vessel for twenty-four hours; add the remainder of the water and 8 parts of the glycerine, and continue the maceration for three days longer, then add the alcohol and the remaining portion of the glycerine; mix thoroughly together and macerate, with occasional agitation, for ten days; finally transfer to a percolator, and displace as described in Sec. 40, Part I., using for the purpose a mixture of alcohol, 7 parts, glycerine, 11 parts, water, 17 parts, continuing the process until there is obtained of the percolate *thirty-five (35) parts*.

A syrup as follows, $\frac{5N}{42}$:

Take of Wild cherry bark, <i>Tinct. $\frac{N}{1}$, five parts</i>	. . . . . 5
Water, <i>eleven parts</i>	. . . . . 11
Sugar, in coarse powder, <i>twenty-six parts</i>	. . . . . 26

Mix the tincture with the water, and filter through paper if the liquid is turbid, adding water through the filter to make the filtrate weigh sixteen (16) parts. Add the sugar and agitate until dissolved.

(Equivalent to Syr. Pruni. Virg., U. S. P., $\frac{12N}{100}$.)

Uses.—The processes described produce a tincture and syrup of wild cherry representing the tonic and astringent principles of the drug, together with the influence of the hydrocyanic (prussic) acid generated in the process. In irritable conditions of the gastro-intestinal, respiratory, or urinary tracts, characterized by slow digestion, acidity of the stomach, cough, excessive secretion, and associated with irregular or intermittent action of the heart, the pulse being quick and weak, this drug will be found very valuable.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00.

PSORALEA MELILOTOIDES. Psoralea.

The fresh herb in flower.

Leguminosæ, Papilionaceæ.

Miehaux.

Constituents.—*Resin* and *volatile oil* are present, but the plant has not been analyzed.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This, with other species of *Psoralea* indigenous to this country, is deserving of investigation.

The preparations given are suggested for trial; other species may be similarly prepared.

It influences the gastro-intestinal tract as a gentle stimulating aromatic tonic, and may prove useful in irritable dyspepsia and diarrhœa.

Dose.—Tincture, $\frac{N}{i}$, gtt. v. to xxx. = gm. 0.33 to 2.00.

PTELEA TRIFOLIATA. Wafer Ash.

The fresh bark of the root.

Rutaceæ, Xanthoxyleæ.

Linné.

Constituents.—Pungent *resin*, soluble in alcohol and ether, *volatile oil*, the alkaloid *berberina*, *tannin*, and *gallic acid*, are the important constituents.

Preparations.—A tincture, $\frac{N}{i}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—A most useful remedy in disorders of the stomach, the upper intestines, associated glandular apparatus, and for the reflex nervous disturbances, due to the derangements of digestion and assimilation. The conditions benefited by this drug are characterized by fulness and aching in the hepatic region, aversion to fat, longing for acids, bitter taste, pain from eating, languor, despondency, frontal headache, mental confusion, and scanty red urine, depositing a red sediment (urates) on cooling. The remedy has proved a valuable one in asthma probably originating in disorder of the stomach, or the presence in the blood of irritant impurities, originating in faulty assimilation; the first would cause bronchial spasm by a reflex nervous impression, propagated through the gastric portions of the pneumogastric to the medulla, and through it transmitted by the pulmonary filaments of the same nerve; the same results may be induced by a humoral impurity, irritating the pulmonary nerve filaments. It does not give immediate relief in asthmatic attacks, and is used not as a palliative, but curative agent. Its favorable influence is doubtless due to the cure of the functional disorders of assimilation, and the elimination of irritant impurities from the circulation; for this latter purpose it is often associated with diuretic remedies.

Dose.—Tincture, $\frac{N}{i}$, gtt. x. to xv. = gm. 0.66 to 1.00, or equivalent.

PTERIS ATROPURPUREA. Rock Brake.

The fresh plant.

Filices, Polypodiaceæ.

Constituents.—Tannin is the most prominent constituent, though no complete analysis is recorded.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—These are not well defined, owing to imperfect study of the drug. In domestic practice, it has been long employed to control night sweats, diarrhœa, dysentery, hemorrhages, etc.; this will suggest the line for further investigation.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

PULMONARIA OFFICINALIS. Lungwort.

The fresh leaves.

Boraginaceæ.

Linné.

Constituents.—*Mucilage* and *tannin* are present, but no complete analysis has been made.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—A popular remedy in diseases of the respiratory surfaces, which deserves investigation.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

PULSATILLA NIGRICANS. Pulsatilla.

The fresh plant. [Pulsatilla (Anemone, *Linné*) *Pratensis*.]

PULSATILLA NUTTALLIANA. American Pulsatilla.

The fresh plant.

Ranunculaceæ.

Miller. Gray.

Constituents.—An acrid, yellow *volatile oil*, soluble in ether, and convertible by contact with water into anemonin and anemonic acid, is obtained by distillation from both foreign and American pulsatilla. Anemonin ($C_{15}H_{12}O_6$) is, when isolated, colorless, crystalline, inodorous, soluble in chloroform, insoluble in cold alcohol, water, and ether; it exhales acrid vapors when fused. Anemonic acid is white, crystalline, tasteless, and insoluble in neutral solvents. In the fresh plant the juice is acrid and irritating, and this property is more or less common to the *Ranunculus* family, but especially the sections *Pulsatilla* and *Anemone*.

Preparations.—From both varieties.

A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

(The imported German tincture is equivalent to the tincture $\frac{N}{2}$.)

Uses.—A useful remedy in diseases of the gastro-intestinal mucous surfaces, the sexual apparatus, venous system, eyes, and ears. The conditions which especially indicate it are characterized by depression of spirits, nervousness, restlessness, with fear of impending danger, swelling of small joints, wandering rheumatic pains, with but little inflammatory redness, and usually following the sudden arrest of the menses or some form of leucorrhœa, embarrassment of venous circulation (varicosis, phlebitis, etc.), viscid, mucous coating to tongue, headache, and gastric distress after use of rich, greasy food.

Acute cutaneous eruptions, as measles, urticaria, papulæ, etc., inflammations of the conjunctiva, auditory and nasal passages, as coryza, otitis, ophthalmia, styes, gastro-intestinal catarrhs, with nervous depression, leucorrhœal discharges, with the nervous symptoms above alluded to, functional dysmenorrhœa, are disorders often promptly cured by pulsatilla.

Dose.—Tincture, $\frac{N}{i}$, gtt. x. to xxx. = gm. 0.66 to 2.00, to water f $\frac{3}{4}$ iv. = gm. 128.00. Teaspoonful (gm. 4.00) doses.

A lotion adjusted by diluting the tincture with water to avoid irritation of sensitive surfaces, is often a valuable adjunct to its internal use.

PUNICA GRANATUM. Pomegranate.

The dried rind of the fruit (Granati Fructus Cortex).

The recent bark of the root (Granati Radicis Cortex).

Granataceæ.

Linné. Bentley and Trimen.

Constituents.—The active constituent of the rind of the fruit is *tannin* (28 per cent.). The composition of the bark of the root is as yet somewhat obscure. An alkaloid, *pelletierina*, is present, and recently three other volatile alkaloids, not yet studied, are announced. When pure, pelletierina is colorless, aromatic, oily, and soluble in alcohol, water, and chloroform. *Tannin* is present in the bark to the amount of 22 per cent. It also contains *sugar*, *mucilage*, and *pectin*.

Preparations.—From the rind of the fruit, a decoction as in Sec. 18, Part I.

From the bark of the root, a decoction as follows :

Take of recent bark, bruised or crushed, <i>two ounces</i>	(gm. 64)
Add cold water, <i>one and one-half pints</i>	(gm. 750)

Macerate over night and reduce by boiling to one-half (12 fluid-ounces = gm. 384), and strain. To be freshly prepared in each case.

Uses.—The rind of the fruit is used only for its astringency, internally in chronic diarrhœa and passive hemorrhages. Dose, of powder,

grs. xv. to xxx. = gm. 1.00 to 2.00, or equivalent, in decoction. Locally, in decoction, as a gargle in relaxed states of the mucous surface of the cavity of the mouth, and as an injection in leucorrhœa, and in ulcerated conditions of the rectum, uterus, or vagina.

The bark of the root is principally used as a poison to tapeworm (tænia). After a preliminary fast for twelve, or low diet for twenty-four hours, and the removal of any accumulation in the bowels, 12 fluidounces of the decoction as above prepared are given in three portions, with intervals of half an hour between doses. Should any of the doses be rejected, they must be repeated the next day. A few drops of chloroform or ether will allay nausea and assist the action of the drug.

PYRETHRUM. Pellitory.

The root of *Anacyclus Pyrethrum* (*Anthemis pyrethrum*), *Linné*.
Compositæ, Anthemidææ. De Condolle. Bentley and Trimen.

Constituents.—Acrid brown resin, brown and yellow fixed oils, *inulin*; a trace of tannin and mucilage, are the constituents.

Preparations.—A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I.
[Tinctura Pyrethri, U. S. P. = $\frac{N}{5}$.]

Uses.—Pyrethrum is used locally, diluted, as a stimulant in relaxed or parasitic conditions of the velum, pharynx, and tongue. The tincture applied on cotton to carious teeth promptly arrests pain.

PYRETHRUM PARTHENIUM. Feverfew.

The fresh herb in flower (*Matricaria parthen.* *Lin.*).

Compositæ, Senecionidææ.

Smith. Wildenow.

Constituents.—A volatile oil, composed of a hydrocarbon and a stearopton, of the same composition as camphor ($C_{10}H_{16}O$), a bitter principle not yet isolated, and a variety of tannin, are the important constituents.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Used as a remedy for flatulence of hysterical origin, and as a stimulant to antagonize the nervous depression, unpleasant head symptoms, and pains in the pelvic region present in cases of amenorrhœa, dysmenorrhœa, and other disorders of menstruation.

Its bitterness has caused its use as a remedy for gastric atony, loss of appetite, and intermittent fevers.

A native species, *Parthenium integrifolium*, *Lin.*, has especially

been advocated in intermittents. It may be prepared and used in the same manner as *P. parthen*.

Dose.—Tincture, $\frac{N}{i}$, gtt. v. to \mathfrak{zj} . = gm. 0.33 to 4.00, or equivalent. In menstrual disorders, give well diluted with warm water or tea.

PYRETHRUM ROSEUM. Persian Pellitory.

The recent flowers of above, and of *P. Carneum*.

Compositæ, Anthemideæ.

Constituents.—*Volatile oil*; *persicein* and *persiretin*, oleoresinous acid principles; *percicin*, a glucoside, is said to be the active constituent, although some observers attribute its effects to an alkaloid; the point is undetermined.

Uses.—This drug is used in powder exclusively as an insectide, under the name of Persian insect powder. It is not used medicinally.

PYROLA ROTUNDIFOLIA. False Wintergreen.

The fresh plant.

Ericaceæ, Pyroleæ.

Constituents.—No analysis is recorded, but from the resemblance in properties to *Chimaphila* its constituents must be analogous.

Preparations.—A tincture, $\frac{N}{i}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This drug strongly resembles in its action the *chimaphila* (which see). It deserves investigation.

Dose.—Tincture, $\frac{N}{i}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

PYROXYLINUM. Soluble Gun-Cotton.

Dinitrocellulin, or pyroxylin ($C_6H_8(NO_2)_2O_5$), prepared by the action on *one part* of cotton, free from impurities, of a mixture of *twenty parts* of sulphuric acid, specific gravity 1.833, and *eight parts* nitric acid, specific gravity 1.390; when thoroughly washed and dried, four parts of the resulting gun-cotton should dissolve in a mixture of 70 parts of stronger ether and 26 parts of alcohol.

Pyroxylin should be preserved in a dry atmosphere, in vessels which are loosely stopped, and permit free access of air; decomposition, ignition, or explosion may result from tightly confining it, especially if moist.

Uses.—Used exclusively to prepare Collodium (which see).

PYRUS MALUS. Apple Tree.

The fresh bark of the root.

Rosaceæ, Pomeæ.

Constituents.—*Phlorizin*, or *phloridzin* ($C_{21}H_{24}O_{10}$), a glucoside, which crystallizes in fine silky prisms, inodorous, neutral, bitter, soluble in alcohol, slightly soluble in cold water, freely in hot water, and insoluble in ether, is the constituent of most interest, and which imparts to apple-tree bark all its medicinal efficacy. It is found also in pear-, cherry-, and plum-tree barks.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—An excellent remedy in intermittents to prevent the return of the paroxysm after its interruption by the use of quinia. It is especially useful in atonic states of the stomach when sustained tonic impression is desired.

Dose.—Tincture, $\frac{N}{I}$, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent. Phlorizin has been used as an antiperiodic in doses of grs. x. to xx. = gm. 0.66 to 1.33.

QUASSIA. Quassia.

The wood of *Simaruba excelsa*. (*Picræna excelsa*. *Lindley*.)

Simarubaceæ.

De Condolle. Bentley and Trimen.

Constituents.—A bitter principle, *quassiin* ($C_{10}H_{12}O_3$), crystallizing in small, prismatic, silky needles, soluble, freely, in alcohol, less so in ether, and slowly in cold water, is the only constituent of medical interest.

Preparations.—A tincture, $\frac{N}{I}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

[Tinct. quassiae, U. S. P., is of the strength $\frac{N}{10}$.]

A dried extract, $\frac{4N}{I}$, with diluted alcohol, as in Sec. 20, Part I.

Uses.—In debilitated states of the gastro-intestinal canal, characterized by vertigo, vomiting, or regurgitation of food, and headache, more or less constant, quassia is a useful remedy. Diarrhoea from atony is also benefited by it; and the peculiar catarrhal states of the intestinal canal, favorable to the presence of worms, is removed by its use; for ascarides in the rectum it is used by enema.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent, diluted with cold water.

QUERCUS ALBA. White Oak.

The inner bark of the trunk.

QUERCUS RUBRA. Red Oak.

The inner bark of the trunk.

Cupuliferæ.

Linné. Gray. Bentley and Trimen.

Constituents.—*Quercitanic acid*, a peculiar tannin, which is a glucoside, but is not identical with gallotannic acid, as it cannot be converted into gallie or pyrogallie acid, is the important constituent of all the oaks. *Quercitrin* ($C_{33}H_{30}O_{17}$), is a yellow coloring matter found in black oak bark. Some European species contain a bitter principle, which may be present in the above, but has not been isolated.

Preparations.—From each species:

A tincture, $\frac{N}{I}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—All the above species are used for their astringent and tonic influence; and if differences exist in their action they are not defined. When the tissues are enfeebled, the mucous surfaces relaxed and secreting profusely, these drugs serve a good purpose in imparting tone and restoring the relaxed parts to normal functional activity; hemorrhages, diarrhœas, bronchial catarrh, leucorrhœa, etc., can often be restrained by their use internally and locally.

Dose.—Tincture, $\frac{N}{I}$, gtt. x. to xv. = gm. 0.66 to 1.00, or equivalent.

QUERCUS TINCTORIA. Black Oak.

The inner bark of the trunk.

QUILLAIA SAPONARIA. Soap-bark.

The inner bark.

Rosacææ, Rosæ.

Molina.

Constituents.—The important constituent is *saponin* ($C_{32}H_{54}O_{18}$), a white amorphous powder of acid taste, soluble in water and diluted alcohol, insoluble in ether and volatile oils; it froths strongly with water, and with oils forms an emulsion.

Preparations.—A tincture, $\frac{N}{10}$, with diluted alcohol, as in Sec. 47, Part I.

Uses.—Soap-bark has no well defined medical uses. It somewhat resembles senega in its influence when taken internally, and has been

recommended in bronchitis, when chronic, and as a vascular stimulant in dropsy. The tincture has recently been suggested as an emulsifying agent for oils. A decoction is used for cleansing silks.

QUINIA, $C_{20}H_{24}N_2O_2 \cdot 3H_2O$. M. wt. 378. **Quinia.**

The pure alkaloid in needle-shaped crystals, or in granular white powder, containing 14 per cent. of water of crystallization; forming fluorescent solutions with diluted acids, and dissolving without color in concentrated pure sulphuric and nitric acids.

Solubility.—Soluble in boiling alcohol (2 parts), boiling water (250 parts), ether (when amorphous 30 parts, when crystalline 60 parts), chloroform, benzol, and slightly in cold water (1200 parts).

For tests and uses see below.

QUININÆ BISULPHAS, $C_{20}H_{24}N_2O_2 \cdot H_2SO_4 \cdot 7H_2O$. M. wt. 548.
Bisulphate of Quinia.

The pure salt in transparent prisms or needles, and containing 60 per cent. of quinia.

Solubility.—Soluble in water (11 parts) and alcohol (2 parts).

For tests and uses see below.

QUININÆ DIHYDROBROMAS, $C_{20}H_{24}N_2O_2 \cdot 2HBr \cdot 3H_2O$. M. wt. 540.
Dihydrobromate of Quinia.

The pure salt in prismatic crystals, whose solution in water remains clear when mixed with a soluble sulphate (absence of barium), and which contains 60 per cent. of quinia.

Solubility.—Soluble in cold water (7 parts), freely in alcohol and boiling water.

For tests and uses see below.

QUININÆ HYDROBROMAS, $C_{20}H_{24}N_2O_2 \cdot HBr \cdot 2H_2O$. M. wt. 441.
Basic Hydrobromate of Quinia.

The pure salt in silky tufts of needle-shaped, white crystals, whose solution in water should remain clear when mixed with a soluble sulphate (absence of barium), and which contains 73.24 per cent. of quinia.

Solubility.—Soluble in cold water (60 parts), freely in boiling water, and when heated in 4 parts of glycerine, the latter solution remaining clear on cooling.

For tests and uses see below.

QUININÆ HYDROCHLORAS, $C_{20}H_{24}N_2O_2 \cdot HCl \cdot 2H_2O$. M. wt. 396.5.
Hydrochlorate of Quinia.

The pure salt in stellate, needle-shaped, silky, white crystals, or crystalline powder, containing 81.71 per cent. of quinia.

Solubility.—Soluble in water (20 parts), alcohol (3 parts), chloroform (9 parts); slightly in ether, freely and without change of color in dilute or concentrated acids.

For tests and uses see below.

QUININÆ SALICYLAS, $C_{20}H_{24}N_2O_2 \cdot H_2C_7H_4O_3 \cdot H_2O$. M. wt. 480.
Basic Salicylate of Quinia.

The pure salt in white powder, containing 67.5 per cent. of quinia.

Solubility.—Soluble in water (900 parts).

For tests and uses see below.

QUININÆ SULPHAS, $2C_{20}H_{24}N_2O_2 \cdot H_2SO_4 \cdot 7H_2O$. M. wt. 872.
Sulphate of Quinia.

The pure salt in white, silky needles, containing 73.55 per cent. of quinia.

Solubility.—Soluble in alcohol (60 parts) and benzol, sparingly soluble in cold water (790 parts), and slightly only in ether and chloroform.

For tests and uses see below.

QUININÆ TANNAS, $C_{20}H_{24}N_2O_2 \cdot (C_{27}H_{22}O_{17})_2$. M. wt. 1560.
Tannate of Quinia.

The salt in amorphous white powder, containing 20.6 per cent. of quinia.

Solubility.—Soluble in alcohol, insoluble in water.

For tests and uses see below.

QUININÆ VALERIANAS, $C_{20}H_{24}N_2O_2 \cdot C_5H_{10}O_2 \cdot H_2O$. M. wt. 444.
Valerianate of Quinia.

The pure salt in pearly, rhomboidal plates, faint odor of valerianic acid, and containing 72.97 per cent. of quinia.

Solubility.—Soluble in alcohol (6 parts), water (110 parts), and sparingly so in ether.

Tests.—General tests for foregoing salts of quinia:

Ammonium salts; odor of ammonia when heated with liquor potassæ. *Mineral admixtures*; residue after ignition on platinum foil, or after treatment with boiling alcohol. *Stearic acid*; turbidity on dropping alcoholic solution into water, the cloudiness disappearing on gently heating. *Cotton fibre or starch*; insolubility in dilute sulphuric acid (Quinia Sulph.). *Phlorozin, mannit, or sugar*; brown or dark color on treatment with strong, colorless sulphuric acid. *Salicin*; red color when treated with strong sulphuric acid; when pure, no color is produced (applicable to all except tannate).

Special tests for Quinia Sulph. :

Cinchonia, cinchonidia, and quinidia sulphates; turbidity or crystalline floating matter after following test. Agitate 0.5 gram = $7\frac{1}{2}$ grains, of quinia sulph. with 10 cubic centimeters ($2\frac{1}{2}$ fluidrachms) of water warmed to between 50° and 60° C. (122° and 140° F.); allow to cool for 10 minutes and filter. To 5 cubic centimeters ($1\frac{1}{4}$ fluidrachms) of the filtrate add 5 drops of ammonia water and 1.00 gram of ether; agitate together, close the test-tube, and let stand for 2 hours. Both layers of liquid will be clear if the quinia sulph. is pure.

Uses.—Quinia and its salts in small and medium doses stimulate, and in large doses depress, the activity of the cerebro-spinal nervous system. It also influences, through the ganglionic centres, the heart and circulatory apparatus. This combined influence on the circulation and the nervous system gives it the power of checking tissue change, the development of heat, and muscular activity. The element of periodicity whenever recognized, whether originating from a material morbid cause (malaria), or accompanying functional disorders of the spinal-nervous system, is the characteristic and essential symptom when quinia salts are curative. It is used in a large variety of febrile diseases, but it may be laid down as a safe guide for its employment that, in all cases where the element of periodicity is absent, large doses of the drug are harmful and unsafe. As a stimulant to the cerebro-spinal nervous system, it is often useful in states of atony and depression. In these cases, small doses only should be employed.

Dose.—Its antiperiodic action is most certain when the tongue is clean or cleaning, the pulse soft, and the skin moist, or at least not hot and dry. When this condition has been procured by other means, quinia sulph. may be given in one full dose of grs. x. to xv. = gm. 0.66 to 1.00, or the same amount divided into 4 doses, and given at 2 hour intervals, beginning a sufficient time before, so as to administer the last dose one hour before the expected paroxysm.

As a spinal stimulant, grs. ss. to j. = gm. 0.03 to 0.06.

QUINIDIÆ SULPHAS, $2C_{20}H_{24}N_2O_2H_2SO_4 \cdot 2H_2O$. M. wt. 782.
Sulphate of Quinidia.

The pure salt, in needle-shaped crystals.

Solubility.—Soluble in water (350 parts), absolute (32 parts), and ordinary alcohol.

Tests.—Dissolve 1 part of the salt in 50 parts of hot water, add $\frac{1}{2}$ part of potassium iodide; permit the sandy, crystalline precipitate to subside, and, after some hours, filter, and test the filtrate by adding a few drops of ammonia; no appreciable turbidity should be produced. If the precipitate first formed is resinous, *cinchonia*, *cinchonidia*, or both are present.

Uses.—In the same dose and as a substitute for quinia sulph. It is claimed for the salt that it is less likely than quinia to cause nervous disturbances, though it is liable occasionally to cause gastric irritability and vomiting.

RANUNCULUS BULBOSUS. Crowfoot.

The fresh root.

Ranunculaceæ.

Linné.

Constituents.—This species in common with *R. acris*, with which it is sometimes confounded, contains an *acid volatile principle*, with an odor like the radish. Another species, *R. sceleratus*, yields volatile oil which is yellowish acid, and in the presence of water changes into anemonin and anemonic acid. It is probable that the acid principle of the different species of *Ranunculus* are similar or identical. (See *Pulsatilla*.)

Preparations.—A tincture, $\frac{N}{10}$, prepared from the thoroughly bruised fresh root by the process given for *Arum Tryphyll*, *Tinct.* $\frac{N}{10}$, which see.

Uses.—This drug loses its activity by drying. In the fresh state, it irritates or even vesicates when applied to the skin. It has been but little used internally, but is deserving of study as an organic stimulant, and for its local effect (well diluted) in affections of the mucous surfaces. Its analogy to *pulsatilla* and *anemone* will suggest the line of investigation.

Dose.—Tincture, $\frac{N}{10}$, gtt. v. to xv. = gm. 0.33 to 1.00 to water fʒiv. = gm. 128.00. Teaspoonful (gm. 4.00) doses.

RESINA. Resin.

The concrete, brittle, translucent, sometimes transparent resin, obtained after the distillation of the volatile oil from the turpentine of

Pinus palustris and other species of *Pinus*. Its color varies from dark red-brown (black rosin of commerce) to a light amber. The latter sometimes contains water, which renders it opaque, and it is then called white rosin.

Solubility.—Soluble freely in alcohol, fixed and volatile oils, and in ether.

Constituents.—The important constituent is the anhydrid of *abietic acid* ($C_{44}H_{64}O_5$), which is converted into the acid by contact with warm dilute alcohol. This acid is soluble in ether, alcohol, benzol, chloroform, wood spirit, and carbon bisulphide. It forms amorphous compounds with bases. The pinic and sylvic acids formerly considered present, are impure abietic acid.

Uses.—Used as a constituent of plasters to render them adhesive. Not used internally.

RESINA DRACONIS. Dragon's Blood.

The resin obtained from the fruit of *Calamus draco*. (*Dæmonorops*, *Blume*).

Palmæ.

Wildenow.

Constituents.—Dragon's blood consists principally of a *resinous substance* ($C_{20}H_{20}O_2$), soluble in alcohol, benzol, and chloroform, partially in ether and turpentine oil. It contains also a little fat, but is free from benzoic or cinnamic acid, although when heated it has a slight odor resembling benzoin.

Uses.—Occasionally used, in suspension, as an injection in gonorrhœa, and internally to arrest diarrhœa, slight hemorrhage, etc. It is also added to dentrifices.

RESINA ELASTICA. India-Rubber.

An elastic substance, which, in its crude form is the hardened milk juice of several orders of plants of whose species the following are the most prominent:

Euphorbiacæ. *Siphonia Elastica Pers.*

Urticacæ, Artocapexæ. *Ficus Elastica Roxb.*, and *F. indica Roxb.*

Apocynacæ. *Urceola Elastica Roxb.*

Solubility.—India-rubber or caoutchouc is a hydrocarbon ($C_{20}H_{32}$), insoluble in water, dilute acids, and alkalies. Petroleum, benzine, stronger ether, oil of turpentine, and carbon bisulphide dissolve it to a jelly-like mass. It is completely soluble in chloroform, and may be incorporated with fats and fixed oils when heated. Heated with sulphur

it forms vulcanized rubber, which is unaffected by the solvents mentioned; with tar and sulphur it forms, when heated, *hard* rubber, which is quite insoluble, but may be moulded at elevated temperatures.

Uses.—India-rubber has no strictly medicinal uses, and its varied applications in the form of elastic fabrics, or vulcanized, in surgical, orthopædic, and gynæcological appliances and implements, are too well known to require description here. It is a useful addition to some plasters in the proportion of one part to seven or eight of melted plaster, the caoutchouc having been previously dissolved in benzine.

RESORCIN. $C_6H_4(HO)_2$. M. wt. 110. **Resorein.**

The pure chemical, which is meta-dihydroxyl-benzol (see formula), a phenol occurring in tabular prismatic crystals, specific gravity 1.2727 (at 0° C.), phosphorescent when rubbed in the dark, of peculiar, phenol-like odor, and sweetish-bitter taste.

Solubility.—Soluble in water (86.4 in 100 at 0° C.), alcohol, glycerine, and ether; insoluble in chloroform and carbon bisulphide.

Uses.—Introduced as an energetic destroyer of organic germs of putrefaction. Even dilute solutions (1 per cent.) prevent decomposition of blood, urine, and similar easily putrescible matters. The same strength solution is said to arrest existing decomposition, and the septic process artificially produced in animals. Wounds of the cornea, gums, conjunctiva, and other mucous membranes, when artificially produced and infected by micro-organisms, heal quickly and perfectly after being cauterized with resorcin, and stabs or cut wounds always heal by first intention when treated with a one per cent. solution. This strength solution has but little effect on healthy skin or mucous membranes, and is borne better by the respiratory surfaces when administered by spray than any other antiseptic. Applied in crystals, it is valuable as a caustic in catarrhal, tubercular, and syphilitic ulcers, sores, or excrescences, which it acts upon painlessly. It is highly recommended in diphtheritic affections, given internally, and applied locally. If experience bears out these claims, it will prove a valuable remedy.

Dose.—Grs. j. to iv. = gm. 0.06 to 0.24, every two hours, in glycerine or flavored syrup.

RHAMNUS CATHARTICUS. **Purging Buckthorn.**

The recent bark.

The ripe berries.

Rhamnaceæ.

Linné. Bentley and Trimen.

Constituents.—The bark has not been analyzed. The berries yield a

cathartic principle named *rhamnocathartin*, which is bitter, non-crystalline, yellow, and soluble in alcohol and water, but insoluble in ether. This principle is found in the expressed juice, which contains also *tannin*, *sugar*, *gum*, and *green coloring matter*. The berries retain *rhamnin* after the juice is removed, which is yellow, tasteless, and slightly soluble in cold water and alcohol, but soluble in boiling water.

Preparations.—From both bark and berries.

A tincture, $\frac{N}{1}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—A syrup made by dissolving sugar in the fresh juice of the berries is in use in Europe as a purgative for children. Its use is not as common as formerly, on account of the distressing thirst and tormina accompanying its action. The bark has been highly lauded for its alterative influence in serofulous diseases of all forms, and even in cancer. The drug deserves study.

Dose.—Tincture, $\frac{N}{1}$, of bark or berries, gtt. v. to xv. = gm. 0.33 to 1.00, largely diluted in water or syrup, gradually increased, avoiding violent purging.

RHAMNUS FRANGULA. Alder Buckthorn.

The dried bark.

Rhamnaceæ.

Bentley and Trimen.

Constituents.—*Frangulin* or *rhamnoxanthin* ($C_{20}H_{20}O_{10}$), which may be sublimed, forming yellow needles, somewhat soluble in alcohol and ether, freely so in alkalies, but insoluble in water; a glucoside having neither odor nor taste; *yellow resin*, *tannin*, an *amorphous bitter principle*, and in the fresh bark a *volatile principle*, all soluble in alcohol. The bitter principle is purgative.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, 2 parts, water, 1 part, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, 2 parts, water, 1 part, as in Sec. 43, Part I.

Uses.—This drug has been used mainly as a purgative or mild laxative, according to the dose. The undried bark is acrid and harsh in its action, which is accompanied with nausea and tormina. The dried bark is preferable for this reason.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xx. = gm. 0.66 to 1.33, or equivalent.

RHAMNUS PURSHIANA. Chittam Bark.

The recent bark.

Rhamnaceæ.

Hooker's Flora Boreali Americana.

Constituents.—*Brown resin*, bitter, soluble in alcohol, benzole, chloroform, and carbon bisulphide, insoluble in ether; *red resin*, soluble in alcohol, slightly only in ether, chloroform, and carbon bisulphide, insoluble in water; *light yellow resin*, soluble in hot alcohol, carbon bisulphide and chloroform, tasteless, neutral, and insoluble in water; *fixed oil*, *volatile oil*, a *white neutral crystallizable principle*, soluble in alcohol, insoluble in ether, benzole, and chloroform; *wax*, *starch*, *tannic acid*, and *oxalic* and *malic acids*.

Preparations.—A tincture, $\frac{N}{1}$, as with alcohol, 3 parts, water, 2 parts, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, as with alcohol, 3 parts, water, 2 parts, as in Sec. 43, Part I.

Uses.—Recently introduced as a remedy for habitual constipation depending on relaxation of the muscular coats of the intestinal tract. It resembles *R. frangula* in its action, but is milder and less likely to produce tormina.

Dose.—Tincture, gtt. x. to 3j. = gm. 0.66 to 4.00, or equivalent.

RHEUM. Rhubarb.

The root of *Rheum palmatum* and other species of *Rheum* from Chinese Tartary, China, and Thibet.

Polygonaceæ.

Bentley and Trimen.

Constituents.—The active substances found in rhubarb are *chrysophanic acid* (which see), *erythroretin* ($C_{38}H_{36}O_{14}$), yellow, tasteless, freely soluble in alcohol; *emodin* ($C_{40}H_{30}O_{13}$), crystalline, orange-colored prisms, dissolving with a red color in alkalies; *phxoretin* ($C_{32}H_{32}O_{14}$), forming a reddish-brown solution with alkalies, and soluble in alcohol; *aporetin*, blackish, resinous, slightly soluble in alcohol, ether, and chloroform; a glueoside, *chrysophan* ($C_{16}H_{18}O_8$), soluble in alcohol and water, and *rheotannic acid* ($C_{52}H_{52}O_{28}$), soluble in alcohol and water, blackening salts of iron, and precipitating gelatin and albumen. *Sugar*, *fat*, *starch*, *pectin*, and *salts* (notably oxalate of calcium), are also present.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

An extract, with alcohol, as in Sec. 19, Part I.

A dried extract, $\frac{4N}{1}$, with alcohol, as in Sec. 20, Part I.

[Tinetura Rhei, U. S. P. = $\frac{12N}{100}$.]

Note.—The following are given as equivalents of preparations of same name in common use.

Syr. Rhei et Potass Co. (Neutralizing Cordial).

Take of Rheum Tinct., $\frac{N}{1}$, two parts	. . . . .	2
Potassæ bicarb., two parts	. . . . .	2
Alcohol, twenty parts	. . . . .	20
Aq. menth. pip., $\frac{N}{500}$, fifteen parts	. . . . .	15
Aq. cinnamon, $\frac{N}{500}$, fifteen parts	. . . . .	15
Syrup, forty-six parts	. . . . .	46

Dissolve the potassæ bicarb. in the medicated waters, and mix all together.

Tincture Rhei Dulcis, $\frac{8N}{100}$ (Sweet tincture of Rhubarb).

Take of Rhubarb, eight parts	. . . . .	8
Licorice root, four parts	. . . . .	4
Anise seed, four parts	. . . . .	4
Cardamom seed, one part	. . . . .	1

Reduce to powder and proceed as in Sec. 43, using diluted alcohol and making of tincture *one hundred* (100) parts.

[Same as U. S. P.]

Uses.—Rhubarb is stimulant to the muscular coats of the intestinal canal, influencing also its secretory surfaces and associated glands. Small doses impart tone to the mucous surfaces, and are very useful in gastric and duodenal catarrh, and in jaundice caused by the latter condition. In diarrhœa, from irritating ingesta, it should be given in laxative doses at first, and then reduced in amount or frequency. As a laxative, its action is quite satisfactory when repeated in small doses.

In summer diarrhœa of children, when the stools are sour, slimy, apparently fermented, and are accompanied by colic immediately before, and relieved by stool, minute doses are often curative. The influence of small doses deserves more careful study.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xxx. = gm. 0.06 to 2.00.

RHODODENDRON MAXIMUM. Mountain Laurel.

The fresh leaves.

Ericaceæ.

Linné.

Constituents.—These have not been investigated. *Tannin* is present, and a poisonous principle of unknown character.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—In pulmonary complaints, with dry, exhausting cough, scanty expectoration, constricted feeling of chest from dyspnœa, violent pleuritic stitches, this remedy is often very useful. The imported

homœopathic tincture of another species, *R. chrysanthum*, possesses similar properties.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, to water $f\bar{3}$ iv. = gm. 128.00. Teaspoonful doses (gm. 4.00), every hour.

RHUS AROMATICA. Fragrant Sumach.

The fresh bark of the root.

Anacardiaceæ.

Gray's Genera. Aitkin. Wood.

Constituents.—A balsamic resinous *substance*, probably a mixture of fixed and volatile oil with resin, and an *astringent principle*, analogous, if not identical with, gallotannic acid, are the important constituents. Neither have been carefully examined.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—A recently introduced remedy, which promises to prove of great importance, especially in the treatment of diabetes, incipient albuminuria, and to restrain excessive discharges, mucous or hemorrhagic, from the mucous surfaces of the kidneys, bladder, gastro-intestinal canal, uterus, lungs, and bronchi. It is most efficacious in sub-acute and chronic forms of these disorders or after the subsidence of febrile symptoms.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xxx. = gm. 0.06 to 2.00, or equivalent.

RHUS GLABRUM. Sumach.

The fresh bark of the root.

The fresh berries or fruit.

Terebinthaceæ.

Linné. Gray.

Constituents.—*Tannic* and *gallic* acids are the constituents of most importance. The seeds contain *fixed oil*, *tannin*, *malates of potassium* and *calcium*.

Preparations.—From the root bark:

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

From the berries:

A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—*R. glabrum* is principally employed for its restraining influence in various fluxes, as diarrhœa, dysentery, leucorrhœa, etc., or as a gargle

or local application to soft, spongy gums, aphthæ, pharyngitis, etc. For the latter purposes the berries are preferable.

In addition to this influence it acts well in conditions where there is putrescence of excretions, with tendency to ulceration, as in typhus or typhoid.

The berries have some reputation in chronic hoarseness or loss of voice, with dyspnœa, wheezing, etc. Although an old remedy, it needs restudy.

Dose.—Tincture, $\frac{N}{i}$, gtt. j. to xv. = gm. 0.06 to 1.00.

RHUS TOXICODENDRON. Poison Oak.

The fresh leaves.

Terebinthaceæ, Anacardiæ.

Michaux. Linné.

Constituents.—Extremely volatile *toxicodendric acid* is probably the poisonous principle of this drug. *Tannin, fixed oil, mucilage*, and other common principles are also present.

Preparations.—A tincture, $\frac{N}{i}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—A useful remedy in subacute and chronic rheumatic affections involving the white fibrous tissue, the tendons, fasciæ, sheaths of nerves, etc., in cutaneous affections of an erythematous or erysipelatous type, the inflammatory redness involving large areas and even extending to the mucous surfaces, which are red, inflamed, and discharging an acrid secretion. The condition in which *Rhus Tox.* is curative, and which may be present in a large number of maladies, other than of the parts indicated, is characterized by intense redness, burning, and itching when the skin is involved, acrid secretion or burning pain with bright redness of mucous surfaces when they are affected, and aching pain, numbness, and stiffness, worse when the parts are at rest, somewhat relieved by gentle motion or manipulation, in rheumatic disorders, or when there is a paralytic tendency. It is occasionally useful, locally applied to sprains, injuries to tendons, ligaments, etc., when the characteristics above given are present.

Dose.—Tincture, $\frac{N}{i}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent, to water f̄iv. Teaspoonful doses (gm. 4.00). For local use, about twice the amount.

R. Radicans, Lin., or Poison Ivy, is a variety of the *R. Tox.*

R. Venenata, D. C. (R. Vernix, Lin.), or Poison Sumach, probably possess similar, although not identical, properties. All may be prepared for experiment in the same manner as *R. Tox.*

RICINUS COMMUNIS. Castor-Oil Plant.

The fresh leaves.

Euphorbiaceæ.

✱
Linné. Bentley and Trimen.

Constituents.—The seeds yield about 50 per cent. of fixed oil, *Oleum Ricini*, which is viscid, transparent, of slight odor, and slightly acrid taste; its specific gravity is 0.96, and it is composed of a liquid and solid portion, the latter of which is deposited at -18° C. (0° F.). The fatty acid of the liquid portion is called *ricinoleic acid* ($C_{18}H_{34}O_3$), and is peculiar to the plant; that of the solid portion is probably identical with palmitic acid. An acrid principle, which has not been isolated, is present in the oil and seeds; the latter contain protein compounds, among which is one analogous to emulsin. An alkaloid has also been announced, and named ricinin, but its existence is questionable. The oil is freely soluble in alcohol, ether, and glacial acetic acid. The leaves have not been thoroughly analyzed, though the alkaloid above mentioned is said to be present.

Preparations.—A tincture, $\frac{N}{1}$, from the leaves, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, from the leaves, as in Sec. 45, Part I.

The fixed oil, expressed from the seeds.

Uses.—The African custom of fomenting the mammæ with the boiled leaves of the ricinus, to promote the flow of milk in cases of its suspension or late appearance, has led to the employment of a tincture in the same manner, for the same purpose. It is also given internally; and although there is some favorable testimony, the question of its utility is as yet unsettled. The tinctures above mentioned are suggested for further experiment. The oil is a favorite purgative with many to overcome constipation, or to rid the intestinal canal of irritating substances. In intestinal diseases with colic, tenesmus, and frequent watery mucous discharges, with or without blood, small and repeated doses often give curative results. Its offensive taste is the most serious obstacle to its use; mixed with equal parts of glycerine and flavored with *Ol. menth. pip.* or cinnamon, it may be given to most persons without difficulty.

Dose.—As a laxative for children for constipation, or following vermifuge medicines, \mathfrak{zj} . to $\mathfrak{zj}\text{j}$. = gm. 4.00 to 8.00 of the mixture with equal parts of glycerine. For an adult, \mathfrak{zss} . to \mathfrak{zj} . = gm. 16.00 to 32.00. In diarrhœa and dysentery, gtt. x. to xxx. = gm. 0.66 to 2.00, repeated, lessening the dose as soon as satisfied that no irritating substance remains in the intestinal canal.

ROBINIA PSEUDO-ACACIA. Locust Tree.

The fresh bark of the young branches.

Leguminosæ, Papilionaceæ.

Linné.

Constituents.—The bark of the root, of the wood and the flowers, contain a *glucoside* of yellow color, and the root a substance called *robinic acid*, which is believed to be identical with asparagin, together with *albumen*, *starch*, *sugar*, *tannin*, and other principles common to all plants. The bark of the shoots has not been separately examined, but, doubtless, has similar constituents.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—It is claimed that through a direct influence on the medulla oblongata, this drug impresses the pneumogastric nerve and the organs to which it distributes, especially the stomach. Acid eructations, vomiting of sour fluid, burning uneasiness in the stomach, flatulent distention of the stomach and bowels, are the symptoms which characterize the condition when this remedy may be curative. It deserves study.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent, to water f $\frac{3}{4}$ iv. = gm. 128.00. Mix. Teaspoonful doses (gm. 4.00).

ROSA CANINA. Dog Rose.

The enlarged calyx tubes, commonly called fruit (Hips.).

Rosaceæ, Rosæ.

Linné. Bentley and Trimen.

Constituents.—*Malic* and *citric* acids, *malates*, *citrates*, and their salts, *sugar*, *gum*, *resin*, *tannin*, and *wax*.

ROSA CENTIFOLIA. Pale Rose.

The petals.

Rosaceæ, Rosæ.

Linné. Bentley and Trimen.

Constituents.—A minute amount of *volatile oil*, Oleum Rosæ, of pale-yellow color, transparent and solidifying at 10° C. (50° F.) to a mass of scale-like crystals. This oil contains a stearopten, soluble in ether, slightly in alcohol (500 parts), and an elæopten, soluble in alcohol and of undetermined composition; if, while cooling oil of rose to 50° F., the scaly crystals which form do not float in the liquid, but are deposited as a crust, the oil is adulterated with spermaceti.

Preparations.—The volatile oil obtained by distillation with water. A medicated water as follows:

Take of Recent Pale Rose, <i>two parts</i>	. . . . .	2
Water, <i>ten parts</i>	. . . . .	10
Mix them and distil, <i>five parts</i>	. . . . .	5

or, shake thoroughly 2 parts of Ol. Rosæ with lukewarm water, 1000 parts.

ROSA GALLICA. Red Rose.

The petals.

Rosaceæ, Rosæ.

Linné. Bentley and Trimen.

Constituents.—*Quercetic* and *gallic* acids are present, in addition to two fatty substances, and the same constituents as pale rose.

Uses.—The petals of the foregoing species of rose are used on account of their flavor, or in the form of confections, as excipients for pill masses.

ROSMARINUS OFFICINALIS. Rosemary.

The recent leaves.

Labiataæ, Monardeæ.

Linné. Bentley and Trimen.

Constituents.—*Oleum Rosmarini*, or oil of rosemary, is the important constituent. It is liquid, yellowish, or colorless, of specific gravity 0.88 to 0.91, soluble in alcohol, and boils at 165° C. (329° F.). *Tannin*, *resin*, and a *bitter principle* are also present.

Preparations.—A tincture, $\frac{N}{1}$, of the leaves, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, of the leaves, with alcohol, as in Sec. 43, Part I.

A volatile oil, obtained by distillation with water.

A tincture of the oil, $\frac{N}{50}$, as follows:

Take of Oil Rosemary, <i>one part</i>	. . . . .	1
Alcohol, <i>forty-nine parts</i>	. . . . .	49

Mix together.

Uses.—The oil and its tincture, $\frac{N}{50}$, are used locally to destroy lice; for the relief of muscular and neuralgic pains, and to promote the growth of the hair. Internally, it is a valuable stimulant to the nervous system, and is usefully employed in hysterical disorders, to relieve colic, to promote menstruation, etc.

Dose.—Oil, gtt. j. to ij. = gm. 0.06 to 0.13, or equivalent, in tincture, $\frac{N}{50}$.

Tincture, $\frac{N}{1}$, of leaves, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

RUBIA TINCTORUM. Madder.

The root.

Rubiaceæ.

Linné.

Constituents.—Madder contains various coloring matters, which are all believed to be oxidation products of one substance, which is yellow, and is the only one found in the living plant. The important substances in the dry drug are *alizarin* ($C_{14}H_8O_4$), or *madder-red*, which crystallizes to orange-red needles, soluble in alcohol, ether, and boiling water, the solutions being yellow, but reddened by even a trace of alkali. *Purpurine* ($C_{18}H_6O_6$), or *madder-purple*, which occurs in purplish-red, acicular crystals, soluble with a red color in water, alcohol, and solution of potash. *Rubian* ($C_{28}H_{34}O_{15}$), *rubianic acid* ($C_{20}H_{22}O_{11}$); *rubihydrin*, *rubidihydrin*, *ruberythrinic acid* ($C_{16}H_{18}O_9$), *rubitanic* and *rubichloric acids*; *rubiretin*, *verantin*, *sugar*, *citric acid*, and *pectin*.

Preparations.—A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I.

Uses.—This drug is now rarely used, except for its coloring principles. As it was formerly in high repute as an emmenagogue, it will doubtless repay investigation with a view of defining its true action on the genito-urinary organs.

Dose.—Grs. xv. to xxx. = gm. 1.00 to 2.00, or equivalent, in tincture.

RUBUS VILLOSUS. Blackberry.

The recent bark of the root.

Rosacæ, Dryadæ.

Aiton.

Constituents.—*Tannin* is the most prominent constituent, although the drug has not been thoroughly examined.

Preparations.—A tincture, $\frac{N}{1}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—Blackberry bark is a mild but efficacious astringent, with some tonic power, useful when such an influence is desired, as in infantile and other diarrhœa, after the expulsion of irritant ingesta.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to 3j. = gm. 0.33 to 4.00, or equivalent.

The bark of the root of *Rubus Canadensis*, *Lin.*, or *Dewberry*, may be prepared in the same manner, and used in the same dose.

RUDBECKIA LACINATA. Thimble Weed.

The fresh herb in flower.

Corymbiferæ.

Constituents.—The plant has not been analyzed.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Suggested for restudy with especial reference to its influence on the urinary tract.

It has some reputation for the cure of vesical tenesmus, strangury, etc.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

RUMEX ACETOSELLA. Sheep Sorrel.

The fresh plant.

Polygonaceæ.

Constituents.—These have not been determined.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

An extract, as follows:

Thoroughly bruise in a mortar a convenient quantity of the fresh plant, add a small quantity of water, and express the juice.

Take of the expressed juice, <i>ten parts</i>	. . . . .	10
Glycerine, <i>one part</i>	. . . . .	1

Evaporate, by exposure to sunlight, in a shallow dish, until reduced to the consistence of honey.

Uses.—This drug has had but limited study, but deserves thorough investigation. Used internally and locally, it opposes the tendency to degeneration of tissue in scrofulous, cancerous, and syphilitic diseases, although to what extent or in what manner is not clearly determined.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent. The extract, locally, in treatment of cancer.

RUMEX CRISPUS. Yellow Dock.

The recent root.

Polygonaceæ.

Linné.

Constituents.—Rumex is closely analogous to rhubarb, its constituent principles being identical, but differing in amount. Astringency is more prominent in rumex than in rhubarb. The constituent formerly known as *rumicin* is proven to be chrysophanic acid.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Rumex is especially useful as a remedy for cough due to or accompanied by exaltation of the sensibility of the mucous membrane

of bronchi, trachea, or larynx. The condition is characterized by an excoriated feeling behind the sternum, dry cough, aggravated by cool air, and at night. The drug also influences the gastro-intestinal tract, skin, and lymphatics, and has been much employed in these difficulties, but, owing to the fact that it was usually associated with other drugs, its benefits were not clearly recognized. An ointment made by incorporating the tincture, $\frac{N}{I}$, with melted lard or simple cerate, may be used as a substitute for chrysophanic acid for local use in skin diseases.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to iij. = gm. 0.06 to 0.20, or equivalent.

RUTA GRAVEOLENS. Rue.

The fresh leaves.

Rutaceæ.

Linné. Bentley and Trimen.

Constituents.—The volatile oil, *Oleum Rutæ*, is the important constituent. It is a greenish-yellow or colorless oil, specific gravity 0.91, solidifying at a low temperature, and consists of a small amount of hydrocarbon with an oxygenated body which has been proven to be methylnonylketone ($\text{CH}_3\text{CO.C}_9\text{H}_{19}$). It is soluble in alcohol. The drug contains, in addition to the oil, a glucoside, *rutin*, obtainable in yellow needles, of a bitter taste, and of the composition $\text{C}_{25}\text{H}_{28}\text{O}_{15}$, *resin*, and a *compound* resembling coumarin.

Preparations.—From the leaves:

A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{3}$, as in Sec. 45, Part I.

The volatile oil, prepared by distillation with water, from the leaves.

A tincture of the oil, $\frac{N}{10}$, with alcohol, as in Sec. 46, Part I.

Uses.—This drug increases arterial tension, the action of the heart, and the secretions of the cutaneous bronchial and urinary tracts. It directly influences the walls of the uterus, increases the supply of blood to the pelvic organs, and promotes their functional activity. In large doses it is a dangerous agent. Functional inactivity of the ovaries and uterus being present, it may be employed to promote the menstrual flow. In minute doses it is useful in menorrhagia, or uterine hemorrhage, following miscarriage, when a lack of tone is manifest in the vascular system. Flatulent, hysterical, and uterine colic are often promptly relieved by this agent, which may be given internally or by enema. Drop doses of the tincture, $\frac{N}{I}$, night and morning, have proven beneficial in amaurotic conditions, causing dimness of vision, such as follows straining the eyes in reading by imperfect light.

The drug deserves careful restudy.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.
Tincture Ol. Rutæ, $\frac{N}{10}$, gtt. j. to v. = gm. 0.06 to 0.33.

SABADILLA. Cevadilla.

The seed of *Veratrum sabadilla* (*Schœnocaulon officinale*, Gray. *Asagraræ officinalis*, Lindley).

Melanthaceæ.

Schlect. Bentley and Trimén.

Constituents.—The alkaloid *veratria* is the most notable constituent; *cevadina* ($C_{32}H_{49}NO_9$), a crystallizable alkaloid; *veratric acid* ($C_9H_{10}O_4$), crystallizing in needles, soluble in alcohol and hot water; *fat, wax*, and a *gum* are also present. Other alkaloids and acid principles than those mentioned have been announced, but they are probably decomposition products.

Preparations.—From the fresh powdered seeds:

A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I.

Uses.—Principally used as the source of *veratria* (which see). Applied locally after a warm bath, the tincture is said to be an efficacious remedy for scabies; it should be diluted when used.

The drug is deserving of study to determine its influence on the nervous and circulatory systems.

Dose.—Tincture, $\frac{N}{5}$, gtt. j. to v. = gm. 0.06 to 0.33.

SABBATIA ANGULARIS. American Centaury.

The recent herb (*Chironia angularis*, Linné).

Gentianaceæ.

Pursh.

Constituents.—The bitter principles of this plant have not been isolated in a pure state. Tannin is absent, and the plant possesses no astringency.

Preparations.—A tincture, $\frac{N}{1}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—A useful remedy in atonic states of alimentary canal, characterized by increased mucous secretion. It has some reputation also as a prophylactic against periodic disease, and as a tonic in convalescence and debilitated states generally.

S. Elliottii or quinine flower is similarly used, and may be prepared in the same manner.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

SABINA. Savine.

The fresh tops of *Juniperus sabina*.

Coniferæ.

Linné. Bentley and Trimen.

Constituents.—The volatile oil, *Oleum Sabinæ*, is the most important constituent; its specific gravity is variable, but usually 0.91, and it is colorless when pure; in composition, it agrees with that of turpentine oil ($C_{10}H_{16}$), and is soluble in absolute alcohol and in twice its weight of alcohol of specific gravity .85. *Resin, tannin*, and principles common to other plants are also present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

The volatile oil prepared by distillation with water.

Uses.—Savine is a direct stimulant to the generative organs of women, and to the urinary and intestinal tracts. It is indicated when the condition is one of loss of tone in the vessels of these parts, such as exists in uterine hemorrhage and menorrhagia, the blood being dark and clotted; in leucorrhœa, copious in amount, and accompanied with severe sacral and pubic pains, constipation, and piles, with pain from back to pubis, vesical catarrh, ardor urinæ, with discharge of dark, bloody urine, with tenesmus in abdominal region; it is also emmenagogue in atonic states of the uterus. It should be used in small doses, repeated at short intervals, and only in the absence of vascular excitement.

Dose.—*Ol. sabinæ*, gtt. j. to iij.

Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

SACCHARUM, $C_{12}H_{22}O_{11}$. M. wt. 342. Sugar.

Pure, refined cane sugar (saccharose) of commerce, obtained from *Saccharum officinarum*.

Graminaceæ.

Linné. Bentley and Trimen.

Solubility.—Soluble in water ($\frac{1}{2}$ part); alcohol, specific gravity .830, dissolves it when hot (1 in 4), but it deposits on cooling, it is freely dissolved by diluted alcohol; insoluble in chloroform and ether.

Tests.—*Glucose*; red deposit (cuprous oxide) on boiling a solution with a little solution of cupric sulphate and excess of liquor potassæ or sodæ.

Solubility as above given.

Uses.—The food value and culinary uses of sugar need not be discussed. It is extensively used in various forms of medicines to pre-

serve from oxidation, fermentation, or decomposition, or to render palatable the substances with which it is associated. Special applications appear in many instances throughout this work.

Grape sugar occurs in commerce in mass of white color, irregularly granular, and in dense syrup called glucose. Both are glucose more or less pure, which, when crystallized from alcohol, has the composition $C_{12}H_{24}O_{12} \cdot 2H_2O$. M. wt. 396. It is less sweet than saccharose, freely soluble in water and alcohol (50 parts), insoluble in ether. The granular form is a frequent adulterant of moist sugars, and both forms are extensively used in the manufacture of candy.

Their presence may be detected by test given above.

SACCHARUM LACTIS, $C_{12}H_{22}O_{11} \cdot H_2O$. M. wt. 360.

Sugar of Milk.

The pure crystalline sugar, prepared from whey of cow's milk.

Solubility.—Soluble in water (6 parts), insoluble in alcohol and ether.

Uses.—Sugar of milk is chiefly used as a vehicle for medicines, and, on account of the hardness of its crystals, it assists to reduce them to fine powder when triturated. It is less sweet than cane sugar, and less apt to ferment. (See Sec. 49, Part I.)

SALIX ALBA. White Willow.

The fresh bark.

Salicaceæ.

Linné. Bentley and Trimen.

Constituents.—The glucoside, *salicin* ($C_{13}H_{18}O_7$), present in this species, but usually prepared from *S. helix*, Linné, and which, when pure, forms neutral, white shining, inodorous, bitter needles or scales, is the constituent of the greatest interest. It is soluble in alcohol and water, and under the influence of saliva splits into glucose and saligenin. The latter substance is converted by oxidizing agents into salicylic and salicylous acids. *Tannin*, fatty matters, and gum are also present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Salicin as above described. [Salicinum, U. S. P.]

Uses.—In atonic conditions of the gastro-intestinal tract, when there is increased mucous secretion with a tendency to fetor or fermentation, this will be found a valuable remedy. It promotes appetite and digestion, prevents or arrests fermentation, and is without irritating properties. Salicin has been strongly recommended in acute rheumatism, given in the same cases in which salicylic acid is employed.

In intermittents, typhoid diseases, and in diarrhœas of children, when the conditions above alluded to are present, salix and its active principle is worth careful study.

Dose.—Tincture, $\frac{N}{i}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.
Salicin grs. j. to x. = gm. 0.06 to 0.66.

S. niger may be prepared and employed in the same manner as *S. alba*.

SALVIA OFFICINALIS. Sage.

The fresh plant in flower.

Labiatae, Monardææ.

Linné. Bentley and Trimen.

Constituents.—The volatile oil of sage is its most important constituent; it is of a greenish-yellow, specific gravity 0.86 to 0.93, freely soluble in alcohol, and is composed of a light portion, terpene $C_{10}H_{16}$, and a stearopten resembling ordinary camphor.

Preparations.—A tincture, $\frac{N}{i}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{x}$, as in Sec. 45, Part I.

Uses.—Although a feeble remedy, it directly influences the skin, and to a less extent the kidneys and mucous surfaces. It is popularly employed in cold infusion to control excessive sweating, and usefully so for this purpose when the circulation in the skin and extremities is enfeebled, the tissues being soft, relaxed, and feeling cool. The colliquative sweats of phthisis, accompanied by hectic fever, are not benefited, materially, by this drug. It is useful alone, or with bitter tonics, in relaxed states of mucous surfaces, which secrete profusely and locally in ulceration of the same, to promote healing.

Dose.—Tincture, $\frac{N}{i}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

SAMBUCUS CANADENSIS. Elder.

The fresh inner bark.

The fresh flowers.

The fresh, ripe berries.

Caprifoliaceæ.

Linné. Bentley and Trimen.

Constituents.—Although no analysis has been made of the American elder, its constituents are probably similar to, if not identical with, those of *S. nigra* of Europe. The bark of this species contains *viburnic*, identical with valerianic acid. Its flowers contain *volatile oil*, *resin*, *tannin*, and the common non-medicinal constituents of plants. The berries contain sugar, mucilage, and malates.

Preparations.—From both bark and flowers :

A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A glycerite as follows :

Take of Tincture, $\frac{N}{I}$, one part 1

Glycerite of starch (Sec. 22, *b*, Part I.), freshly prepared,
and still warm, nine parts 9

Mix together, heat in a water-bath until the alcohol has evaporated, remove from heat, and stir until cool. (An ointment may be made by covering the flowers or bark with fresh lard or unsalted butter, boiling gently until crisp, and straining.)

An extract of the berries, as follows :

Heat the fresh berries until they burst ; express the juice, strain and evaporate the clear liquid until of the consistence of an extract. To each 12 parts of extract thus obtained, add one part of powdered sugar. This is the process of the German Pharm. for *Succus Sambuci*.

Uses.—This very common plant deserves more careful study than it has heretofore received. Its influence upon the excretory glands, especially of the skin and mucous surfaces, is marked, increasing their functional activity. The indications for its use are not clearly defined, but fulness or oedema of the tissues with evident excess of water in the part, eezematous eruptions with abundant discharge, ulceration with free serous secretion, are said to characterize the conditions in which it is curative. Its strong resemblance to the *S. nigra* suggests its employment in cases of nocturnal asthma coming on suddenly, the perspiration being suppressed during sleep, and returning as the paroxysm subsides. In eruptive diseases it is used internally and locally.

The extract or juice of the berries makes a grateful drink in febrile affections, and those of the kidneys, bladder, and intestines.

Dose.—Tincture, $\frac{N}{I}$, of bark or flowers, gtt. ij. to x. = gm. 0.13 to 0.66, or equivalent.

SANICULA MARILANDICA. Sanicle.

The fresh root.

Umbelliferæ, Orthospermæ.

Linné. Gray.

Constituents.—The plant has not been analyzed.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—The indications for the use of sanicle are not well defined. The fresh roots, when chewed, are pungent and aromatic, and somewhat impair the sensibility of the nerves of taste. It is employed in domestic

practice in irritable and catarrhal conditions of the vaginal and genito-urinary surfaces, and to quiet nervous irritability. These uses will suggest the line of a more careful study of the drug.

Dose.—Tincture, $\frac{N}{i}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

SANGUINARIA CANADENSIS. Blood Root.

The recent rhizome.

Papaveraceæ.

Linné. Bentley and Trimen.

Constituents.—The alkaloid, *sanguinarina* ($C_{19}H_{17}NO_4$), which is identical with chelerythrina from *cheledonium majus*, is the most important constituent. When pure it is a white powder, or in needle-shaped crystals, soluble in alcohol and ether, and forming bright red salts when combined with acids. The sulphate and nitrate of this alkaloid are well known in commerce, and form convenient and concentrated forms of the medicine. *Porphyroxin* and *puccina* are two alkaloids of minor importance also found in this drug, although the existence of the latter is questionable. *Resin* is present, and *chelidonic acid*, with the latter of which the alkaloids are probably in combination in the drug.

Preparations.—A tincture, $\frac{N}{i}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

A glycerite, $\frac{N}{i}$, prepared as directed for *hydrastis glycerite*, $\frac{N}{i}$.

A dried extract, $\frac{4N}{i}$, as in Sec. 20, Part I.

A vinegar, $\frac{N}{i0}$, as in Sec. 14, Part I. [U. S. P.]

Sanguinarina sulphate and nitrate, soluble in alcohol, glycerine, syrup, and water.

Uses.—*Sanguinaria* exerts a marked influence on the respiratory and vaso-motor centres, small doses increasing and large doses diminishing (even to paralysis) innervation from these sources. Its sphere of usefulness as a remedy includes the pneumogastric nerve and its distribution, but especially the pulmonary branches. Locally applied it first stimulates and finally exhausts the contractility of muscular fibres of any tissue. The drug is useful in two opposite conditions. In states of atony, with increased secretion from mucous surfaces of stomach, intestines, or bronchia, full doses may be employed; in minute doses, frequently repeated, it is valuable in respiratory diseases when the inspiration is difficult, throat and air passages dry, hot, and swollen, cough harsh and dry, pulse frequent and reduced in force, face swollen, circumscribed redness of cheeks; also in gastric disorders characterized by burning in stomach, temporarily relieved by eating, and as a stimu-

lant to the vegetative processes generally. The symptoms in these cases indicate vascular distension of the part from vaso-motor depression.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent, to water f̄ziv. = (gm. 128.00). Teaspoonful doses.

Sanguinarina nitrate or sulphate, grs. $\frac{1}{10}$ to $\frac{1}{100}$, in trituration (Sec. 49, Part I.) or solution.

A syrup may be made by dissolving in the vinegar, 2 *parts*, sugar, 3 *parts*.

SANTALUM ALBUM. Sandalwood.

The wood.

Santalaceæ.

Linné. Bentley and Trimen.

Constituents.—*Volatile oil, resin, and tannin.* The volatile oil of sandalwood is its important constituent. It is yellowish, specific gravity 0.96, soluble in alcohol (80 per cent.), its solubility decreasing with age. It is often adulterated with oil of cedar, which has brought its use into disrepute.

Preparations.—The pure oil.

Uses.—Oil of sandalwood influences the mucous surfaces, especially of the urinary tract, constricting them and restraining abnormal discharges. It is principally employed in gonorrhœa, when the discharge is thick and purulent, and the patient complains of scalding. The mucous surfaces are left in an irritable condition after the use of the drug, though the discharge has ceased. For this reason, abstinence from stimulants and purgatives, which cause determination of blood to the pelvic viscera, should be enjoined for several days after the drug is stopped.

Dose.—Gtt. v. = gm. 0.33, of the oil, every 4 hours, in mucilage or capsule.

SANTALUM RUBRUM. Red Saunders.

The wood of *Pterocarpus Santalinus*.

Leguminosæ, Papilionaceæ.

Linné. Bentley and Trimen.

Constituents.—The important constituent is *santalic acid* ($C_{15}H_4O_5$), which, when separated, forms minute needles of a red color, insoluble in water, soluble in alcohol with a red, and in ether with a yellow color. It dissolves also with a deep-red color in sulphuric acid, and alkalis render its solution of a violet shade. It is soluble in a few volatile oils, but insoluble in most fixed oils.

Uses.—Saunders has no medicinal value, and is used only for its coloring properties.

SANTONICA. Levant Wormseed.

The unexpanded flower-heads of *Artemesia Cina*, *Berg.*; *A. maritima*, var. *Stechmanniana*, *Besser.*

Compositæ, Senecionidæ.

Bentley and Trimcn.

Constituents.—A *volatile oil*, which is pale-yellow, specific gravity 0.92, soluble in ether and alcohol. *Resin* and *santonine* ($C_{15}H_{18}O_3$. M. wt. 246) are the important constituents. The last crystallizes in colorless, pearly, flat prisms, of a slightly bitter taste, which are colored yellow by exposure to light, and should, therefore, be kept in bottles from which sunlight is excluded. Santonine dissolves in alkaline solutions, forming true salts, from which santoninic acid ($C_{15}H_{20}O_4$ or $H_2C_{15}H_{18}O_4$) can be obtained. Santonine is, therefore, *santoninic anhydride*. It is soluble in alcohol, of specific gravity .848, 43 parts at 17.5° C. (63.5° F.); in ether, 72 parts; in chloroform, 4.35 parts, and in warm olive oil, acetic acid, and volatile oils.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Santonine as above described.

Uses.—Santonica and santonine are chiefly employed to destroy intestinal worms, especially lumbrici and ascarides. For this purpose the santonine is the most eligible, and should be administered when the stomach is empty. It also directly influences the bladder and urethra, and in being excreted colors the urine of a saffron tint. In retention of urine, enuresis, dysury, and chronic cystitis it will be found useful. The peculiar nervous symptoms following the employment of large doses has suggested its use as a nerve stimulant, especially in failure of, or imperfect vision due to, depression of the optic nerve. The peculiar intermittent fever of infants, simulating that caused by worms, but due to gastro-intestinal irritation, will usually yield to this remedy given in small doses.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

Santonine, grs. $\frac{1}{10}$ to j. = gm. 0.006 to 0.06, in trituration (Sec. 49, Part I.), or dissolved in alcohol.

Santonate of soda has been suggested for use as more soluble than santonine, but it is no more efficient, and is more disagreeable.

The same is true of oil of wormseed.

SAPONARIA OFFICINALIS. Soapwort.

The dried root.

Caryophyllaceæ.

Linné.

Constituents.—Soapwort owes its peculiar properties to *saponin* ($C_{32}H_{54}O_{18}$), identical with that obtained from Quillaia bark, and probably also (though the point has not been finally determined) with polygalin or senegin of senega root. Resin and the common non-medicinal constituents are also present.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.
A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Saponaria deserves more attention than it has heretofore received, especially to determine its influence on the skin, mucous surfaces and fibrous tissue. In catarrhal states of the mucous surfaces, small doses render the secretion normal in character and amount. It increases the functional activity of the glandular system generally, and will, doubtless, prove useful where an alterative influence is desired. Doughiness of tissue and torpidity of the excretory glands are conditions in which it may be employed.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent. The herb may be prepared and used in the same manner and dose.

SARRACENIA PURPUREA. Pitcher Plant.

The fresh plant.

Sarraceniaceæ.

Linné.

Constituents.—A volatile acid, *acrylic acid*, and a volatile *alkaloid*, resembling conia in odor, a bitter alkaloid, *sarracenina*, and a yellow coloring matter, *sarracenic acid*, are said to have been found in this plant.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.
A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Introduced as a reliable remedy for variola and varioloid, but the testimony for and against the use of the drug in these cases is about equally balanced. From the fact that the drug possesses volatile constituents, which are doubtless expelled, or at least impaired in amount, either by drying the plant or by hot infusion (the method usually employed), the restudy of the drug is suggested, using a tincture of the fresh plant prepared as above directed.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent, every one or two hours.

SARSAPARILLA. Sarsaparilla.

The root of *Smilax officinalis*, and other species of *Smilax*.

Smilacæ.

Kunth. Bentley and Trimen.

Constituents.—The most important constituent is an acrid glucoside, which has been variously named *smilacin*, pareglin, parellin, salseparin, etc. When pure, *smilacin* is white powder or in colorless needles, soluble in hot water and alcohol, insoluble in ether and chloroform; with water it foams like saponin, with which it seems closely allied. *Saponin* has been found in Rio Negro and Mexican sarsaparilla. A small amount of *essential oil* and *resin* are also present.

Preparations.—A tincture, $\frac{N}{I}$, with alcohol, 1, glycerine, 1, water, 3, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, 1, glycerine, 1, water, 3, as in Sec. 43, Part I.

Uses.—The testimony of different observers, regarding the therapeutic value of sarsaparilla, is quite conflicting, and it is not possible to reconcile them. Some claim it to be a useful remedy, especially in syphilitic disorders; others asserting it to be worthless. Smilacin, the active principle, is a drug of quite positive power. On the whole, sarsaparilla may be considered a stimulant to the sympathetic centres, of not very marked power, but sometimes useful in cases in which it is desired to hasten metamorphosis of tissue, and promote the elimination of morbid matters from the system, by stimulating to increased activity the lymphatic glandular system, the skin, and kidneys.

Dose.—Tincture, $\frac{N}{I}$, gtt. xv. to 3j. = gm. 1.00 to 4.00, or equivalent.

SASSAFRAS OFFICINALE. Sassafras.

The fresh bark of the root. (Cortex.)

The pith obtained from the branches. (Medulla.)

Lauraceæ.

Nees. Linné. Bentley and Trimen.

Constituents.—The volatile oil, *Oleum Sassafras*, is the most important constituent of the bark. It varies in color, being brownish-red when prepared from roots that have remained in the ground some time after the tree is cut; yellowish or colorless when prepared from the freshly dug roots, or when carefully rectified by redistillation. The color does not alter its quality. It is soluble in alcohol, has a specific gravity, when fresh, of 1.090, and is composed of a hydrocarbon, safrene ($C_{10}H_{16}$), and a camphor-like body, safrol ($C_{10}H_{10}O_2$). In addition to the oil, sassafras contains *tannin*, a peculiar body formed by the action of the air on the tannin, and called *sassafrid*, *resin*, wax, starch, mucilage, and coloring matters.

The important constituent of the pith is *mucilage*.

Preparations.—From the bark:

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

The volatile oil distilled from the roots with water.

Uses.—Sassafras increases the functional activity of the skin, mucous membranes, and the kidneys. Its pleasant flavor makes it an agreeable associate of more active remedies, with which it is often given. Its gently stimulating and astringent influence may be utilized in catarrhal states of the mucous surfaces, and to antagonize the depression following long illness, or the use of relaxing drugs, as lobelia, tobacco, etc. The pith is used exclusively in infusion for its mucilage, as a bland application or drink in irritable states of the conjunctiva, alimentary canal, etc.

SAURURUS CERNUUS. Lizard's Tail.

The fresh root.

Saururaceæ.

Linné.

Constituents.—No analysis has been published.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—The uses of this drug are not well determined, but it deserves further investigation.

The plant is acrid to the taste, and has an unpleasant odor. The fresh root is occasionally used in poultice on inflamed and swollen surfaces, abscesses, sore nipples, etc. Internally, in decoction, it has been employed in irritable conditions of the urinary and gastro-intestinal tract. The tincture of the fresh root is suggested for trial in the direction indicated.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent. The plant is known in some localities as swamp lily.

SCAMMONIUM. Scammony.

The root and resinous exudation of *Convolvulus scammonia*.

Convolvulaceæ.

Linné. Bentley and Trimen.

Constituents.—A resinous glucoside, *scammonin*, probably identical with jalapin ($C_{68}H_{112}O_{32}$) (see *Jalapa*), is the important constituent of both the root and the commercial scammony. It is soluble in alcohol, ether, chloroform, and warm alkaline solutions. From the latter it is not precipitated by acids; when pure, it is white, inodorous, and tasteless.

Preparations.—The resin, *Resina Scammonii*, as follows:

Take of Crude scammony, in fine powder, <i>ten parts</i>	. . . . . 10
Alcohol, <i>a sufficient quantity</i>	. . . . . q. s.
Water, <i>a sufficient quantity</i>	. . . . . q. s.

Digest the scammony in a closed vessel, with successive portions of alcohol until exhausted; mix the tinctures thus obtained, distil off the alcohol, and add the syrupy residue to

Water, <i>twenty-five parts</i> 25
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Separate the precipitate formed, wash thoroughly with water, and dry with a gentle heat.

Resin of scammony may also be prepared from the root by the process given in Sec. 27, Part I.

Uses.—Scammony or its resin is employed occasionally as a cathartic, under the same circumstances in which jalap is usually given. It is more nearly tasteless, but is more drastic than jalap, and is therefore almost always given with other drugs to modify its action.

A trituration (Sec. 49, Part I.) of the resin is worthy of trial, in minute doses, in intestinal disorders with profuse watery stools and severe colicky pains.

Dose.—Scammonium, grs. v. to x. = gm. 0.33 to 0.66.

Resina scammonii, grs. j. to v. = gm. 0.06 to 0.33.

SCILLA MARITIMA. Squill.

The bulb. (*Urginea scilla*, *Steinheil*.)

Liliacæ.

Linné.

Constituents.—The medicinal constituents of squill have not been satisfactorily identified. A bitter glucoside, termed *scillitin*, which is amorphous, neutral, soluble in water, alcohol, and acetic acid, and *skulein*, an acrid, resinous body, soluble in alcohol, are recognized as the medicinal constituents. The drug contains a large amount of gum and oxalate of calcium.

Preparations.—A tincture, $\frac{N}{1}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

A vinegar, $\frac{N}{100}$, as in Sec. 14, Part I. (U. S. P.)

A syrup, $\frac{8N}{100}$, as follows:

Take of Vinegar of squill, $\frac{N}{100}$, <i>forty parts</i>	. . . . . 40
Sugar in coarse powder, <i>sixty parts</i>	. . . . . 60

Heat the vinegar of squill to the boiling point in a porcelain dish, filter while hot, adding water through the filter to make the filtrate weigh *forty* (40) *parts*.

Add the sugar, and agitate until dissolved.

[Tinctura Scillæ, U. S. P. = $\frac{15N}{100}$.]

Uses.—Squill is chiefly employed as a stimulant to the mucous surfaces of the air-passages in conditions characterized by profuse secretion, the sputa being tenacious, and expelled with difficulty. Though contra-indicated in large doses, there is reason to believe that minute doses will prove beneficial when the mucous surfaces are irritable and secretion deficient. Squill is often an effective diuretic in dropsy, especially of cardiac origin, and chronic diseases, in which the kidneys themselves are not involved. It should be used with caution, avoiding irritant effects upon the urinary tract, and suspending its use if nausea supervenes. The remedy needs restudy.

Dose.—Squill powder, grs. j. to iij. = gm. 0.06 to 0.18, or equivalent in preparations.

SCOPARIUS. Broom.

The fresh tops of *Sarothamnus Scoparius*.

Leguminosæ, Papilionaceæ.

Koch. Bentley and Trimen.

Constituents.—The important constituents are *scoparin* ($C_{21}H_{20}O_5$), which may be obtained in neutral, pale-yellow crystals, soluble in alcohol, and free from odor or bitterness, and *sparteina* ($C_{15}H_{10}N_2$), a volatile alkaloid resembling conia, and which, when pure, is a colorless, transparent, oily liquid, non-crystallizable, very bitter, strongly alkaline, and but slightly soluble in water.

Uses.—This drug is used exclusively in decoction (Sec. 18, Part I.), as a diuretic to remove dropsical effusions. It produces its hydragogue effects both by kidneys and bowels, when acute affections of the kidneys do not exist.

Dose.—Of a decoction, $\frac{N}{10}$, an amount representing half an ounce of the drug in 24 hours, in divided doses.

A tincture, $\frac{N}{1}$, as in Sec. 41, Part I., is suggested for study.

SCROPHULARIA MARILANDICA. Figwort.

The fresh plant gathered before the buds develop. (*S. nodosa*.)

Scrophulariaceæ.

Linné.

Constituents.—*Scrophularin*, crystallizing in bitter scales, insoluble in water and alcohol; a stearopten, *scrophularosmin*, acetic, propionic, citric, tartaric, malic, and tannic acids are said to be present. The peculiar principles have not been studied.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Figwort is a drug of undoubted merit, and worth careful study, as the conditions in which it is most useful are not clearly defined. It has long been employed in poultice to cuts, bruises, abscesses, ulcers, felons, etc., and the testimony as to its value is unquestionable. Internally, it influences the skin and glandular system, restoring normal function, promoting absorption of deposits, and repair of ulcerated surfaces. In relaxed and debilitated states accompanying disease of the reproductive organs of females, it will be found a useful organic stimulant and alterative.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

SCUTELLARIA LATERIFLORA. Skullcap.

The fresh herb in flower.

Labiatae, Stachydeæ.

Linné.

Constituents.—No accurate analysis has been made. An *oily substance*, which is soluble in alcohol and ether, and of a yellowish-green color; a *bitter principle*, soluble in alcohol, ether, and water, a small amount of *volatile oil*, and an astringent principle, probably a form of tannin, are stated to be present in the plant.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A dried extract, $\frac{4N}{1}$, as in Sec. 20, Part I.

Uses.—Scutellaria is a remedy of great power in its proper sphere, which, however, is a limited one. It is indicated in impairment in function of the cerebro-spinal centres induced by long illness, excessive study or physical excesses, and characterized by incoördination of muscular movements, tremors, twitchings, restlessness, agitation, sleeplessness, muttering delirium, subsultus tendinum, etc. It is a useful remedy during low fevers, as typhoid, in chorea, epilepsy, hysteria, cerebral irritation from teething, and delirium tremens; some evidence exists of its value in hydrophobia.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

The extract, $\frac{4N}{1}$, represents the drug imperfectly, but it is occasionally useful.

SEDUM ACRE. Stonecrop.

The fresh plant in flower.

Crassulaceæ.

Linné.

Constituents.—An amorphous, acrid *alkaloid*, which is soluble in alcohol, ether, chloroform, and water; acrid *resins*, *rutic acid*, wax, mucilage, sugar, and coloring matters, are said to be present in this plant.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—The bruised fresh plant is occasionally used as a local stimulant to enlarged glands, sluggish ulcers, and chronic cutaneous eruptions; also to remove warts and corns. It is quite acrid, and capable of blistering the skin. Internally, in large doses, it acts as an emetic and purgative, but no well-defined indications exist for its employment. The tinctures are suggested for further study of the drug.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

S. ternatum, *S. pulchellum*, and *S. telephium*, are allied plants and deserve investigation.

SEMPERVIVUM TECTORUM. Houseleek.

The fresh leaves gathered before the buds develop.

Crassulaceæ.

Linné.

Constituents.—No accurate analysis has been made. The leaves have an acidulous taste and contain malates.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Locally, the houseleek has been employed, bruised, as an application to ulcers, burns, stings, etc., its juice being used also mixed with cream for ophthalmia, erysipelatos, and other superficial inflammatory conditions. Internally, the sweetened juice has been used in fevers, dysentery, etc. This will indicate the line of experiment with the drug, which should be restudied, using the tinctures above suggested.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to 3j. = gm. 0.66 to 4.00.

SENECIO AUREUS. Life Root.

The fresh plant in flower.

Compositæ, Senecionidææ.

Linné.

Constituents.—This plant has not been carefully analyzed. In the fresh state it has some acidity, and there is evidence of the presence of some volatile oil. The plant loses much of its activity by drying.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Functional derangement of the reproductive organs of females present the conditions in which Senecio is especially useful, but all the pelvic viscera of both sexes come under its influence, though but in a limited degree in the male. The condition, which it best relieves, seems to be one of venous and capillary congestion, with sluggish circulation in the vessels causing fulness, weight, and dragging in the pelvis, involving all of its contents to a greater or less extent, producing a catarrhal state of mucous surfaces, or burning and irritation in some stages. It may be indicated in uterine, vaginal, ovarian, vesical, renal, and intestinal disorders, and in all stages from irritation with capillary engorgement to a catarrhal or even hemorrhagic condition. There is reason to believe that the influence on the vessels extends throughout the body, and that it will prove useful in irritable states of the pulmonary mucous surfaces, coughs with bloody expectoration, etc.

Dose.—Tincture, $\frac{N}{i}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

SENEGA. Seneka.

The dried root of *Polygala Senega*.

Polygalaceæ.

Linné.

Constituents.—A trace of *volatile oil*, a small amount of *resin*, pectin, and sugar are present, but the important constituent is *polygalic acid*, a glucoside probably identical with saponin. A bitter principle, *isolusin*, and an acid, *virgineic acid*, are also stated to be present, but have not been examined.

Preparations.—A tincture, $\frac{N}{i}$, as in Sec. 40, Part I., using diluted alcohol, 50 parts, ammonia water, 1 part.

A syrup, $\frac{16N}{100}$, as follows:

Take of Tincture, $\frac{N}{i}$, sixteen parts	16
Precipitated phosphate of calcium, two parts	2
Sugar, sixty parts	60
Water, a sufficient quantity	q.s.
Mix the tincture with water, twenty-five parts	25

Shake well, and allow the mixture to rest for two hours; triturate the phosphate of calcium with the liquid added in small portions, until a uniform mixture is obtained; agitate, and filter through a wetted filter. Wash the filter with water sufficient to make the filtrate weigh *forty (40) parts*.

To this add the sugar, agitate until dissolved, and make of syrup *one hundred (100) parts*.

Uses.—Senega is chiefly used as a stimulant to the bronchial mucous

membrane to promote secretion, when there is a sense of tightness and oppression across the chest, and a cough exists, which is dry and irritating. In the opposite condition, when secretion is profuse, the cough loose and rattling, it restrains the secretion and promotes its expulsion.

Dose.—Tincture, $\frac{N}{i}$, gtt. v. to xv. = gm. 0.33 to 1.00.

Syrup, 3ss. to 3j. = gm. 2.00 to 4.00.

SENNA. *Senna*.

The dried leaves of *Cassia acutifolia*.

Leguminosæ, Cæsalpiniæ.

Delile. Bentley and Trimen.

Constituents.—The acid glucoside, *cathartic acid*, which has been described (see *Acid, Cathartic*), is the important constituent of senna. It exists in the drug in combination with calcium or magnesium, and in this form is insoluble in alcohol, but soluble in water. An acrid principle, *sennacrol*, and a bitter principle, *sennapicrin*, are announced, but are imperfectly known. Yellow coloring matter and a form of sugar are of minor importance. The principle, which causes griping when senna is administered, may be removed by digesting the leaves in alcohol, expressing and drying.

Preparations.—A tincture, $\frac{N}{i}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{x}$, with diluted alcohol, as in Sec. 43, Part I.

An infusion, $\frac{N}{i\bar{o}}$, with boiling water, as in Sec. 23, Part I.

(To correct griping add coriander seeds, bruised, one part for each ten parts of senna.)

Uses.—Senna is almost universally employed for its purgative effects only. It is usually associated with other substances to correct griping. The tincture deserves study, in small doses, in abdominal colic, whether flatulent or bilious. A powder from the leaves which have previously been digested with alcohol (see above), is a pleasant form for use alone or associated with aromatics.

Dose.—Tincture, $\frac{N}{i}$, gtt. x. to 3j. = gm. 0.66 to 4.00, or equivalent, with some aromatic carminative vehicle. The U. S. P. confection of senna is convenient for children.

(See *Cassia Fistula* for composition.)

SERPENTARIA. *Virginia Snakeroot*.

The recent root of *Aristolochia serpentaria*, of *A. reticulata*, and other species of *Aristolochia*.

Aristolochiaceæ.

Linné. Nuttall. Bentley and Trimen.

Constituents.—*Volatile oil, aristolochine*, a bitter principle, soluble in water and alcohol; a *camphor-like* body, tannin, and other constituents of no importance.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

[Tinctura Serpentariæ, U. S. P. = $\frac{N}{10}$.]

Uses.—Serpentaria is stimulant to the vascular system and its central organ, increasing the force and frequency of the pulse, promoting secretion of mucous surfaces, exhalation from the skin, and causing cerebral excitation and resulting nervous phenomena. In large doses, this influence may result in unpleasant oppression of the brain, headache, nausea, vomiting, and diarrhœa. Medicinally, it is a useful agent in atonic and torpid states of the organism, as in typhoid, typhus, and the depression of diphtheria, scarlatina, chronic bronchitis, and pneumonia, to promote elimination, sustain the flagging powers, and assist expectoration.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

SESAMUM. Benne.

The fresh leaves of *Sesamum indicum*.

The seeds of the same.

Pedilaceæ.

Linné. Bentley and Trimen.

Constituents.—The leaves contain a large amount of *mucilage*. The seeds yield by expression nearly 50 per cent. of their weight in bland, *fixed oil*, *Oleum Sesami*, which is of a yellow color, with little odor, agreeable taste, and specific gravity 0.923 at 15° C. (59° F.). It contains 76 per cent. of olein, with considerable stearic, palmitic, and myristic acid, and a minute amount of a resinous substance.

Preparations.—An infusion, $\frac{N}{10}$, from the fresh leaves, with cold water, as in Sec. 23, Part I.

The expressed oil of the seeds.

Uses.—Benne is not actively medicinal. An infusion of the fresh leaves forms a useful demulcent drink for use in irritable conditions of the intestinal canal. The oil is used for similar purposes as olive oil. The seeds are said to prove emmenagogue in decoction, and are also employed, bruised, in form of poultice, to promote maturation.

SEVUM. Suet.

The prepared suet of *Ovis Aries*, the sheep.

Mammalia, Ruminantia.

Linné.

Constituents.—Suet is composed principally of *stearin*, with smaller amounts of *palmatin*, *olein*, and *hircin*. It is soluble in ether, benzine, and partly in alcohol.

Uses.—When fresh, it is a useful dressing to inflamed and excoriated surfaces. Should not be used when it has become rancid, which renders it irritating.

SILPHIUM GUMMIFERUM. Resin Weed.

The fresh herb in flower.

Corymbiferæ.

Constituents.—Resinous and balsamic constituents are present in large amount, but the drug requires further examination.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A saccharated extract, $\frac{N}{1}$, with alcohol, as in Sec. 21, Part I.

Uses.—A useful remedy in affections of the mucous membranes, particularly of the respiratory surfaces, characterized by engorgement and profuse, exhausting secretion of mucus. It may be employed in catarrhal asthma, bronchorrœa, coryza, influenza, and the copious expectoration of phthisis. Similar conditions in other mucous surfaces have been benefited by its use. In irritable state of these surfaces, with spasmodic cough, dryness, tickling in fauces and throat, the dose must be very minute, if used at all. The drug should be further studied.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

The saccharated extract, $\frac{N}{1}$, is the most convenient form for use.

SILPHIUM PERFOLIATUM. Indian Cup Plant.

The fresh root.

Corymbiferæ.

Constituents.—These have not been investigated.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—But little is known of this drug. It has been recommended for treatment of congestion of liver and spleen, and for ague cake. The drug should be investigated.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

SIMARUBA OFFICINALIS. Simaruba.

The bark of the root.

Simarubaceæ.

De Condolle. Bentley and Trimen.

Constituents.—A *bitter* principle, supposed to be identical with quasin ($C_{10}H_{12}O_5$), is the important constituent. Traces of *volatile oil*, *resin*, *gallic acid*, *malate* and *oxalate of calcium*, with a large amount of mucilage, are also present.

Preparations.—A decoction, $\frac{N}{10}$, as follows:

Uses.—This drug is but little used, but the decoction has, in many instances, been of much value in dysentery and chronic diarrhœa.

Dose.—Decoction, $\frac{N}{10}$, 3j. = gm. 4.00, every 3 hours.

SINAPIS ALBA. White Mustard.

The seed.

SINAPIS NIGRA. Black Mustard.

The seed.

Cruciferæ, Siliquosæ.

Linné. Bentley and Trimen.

Constituents.—The pungent and irritant properties of both white and black mustard are developed by a species of fermentation, induced by a proteid substance common to both kinds of seeds, and called *myrosin*, which is coagulated and rendered inert by both heat and alcohol.

Sinalbin ($C_{30}H_{44}N_2S_2O_{16}$) is a glucoside found in white mustard, which, when pure, forms small glassy prisms, soluble in water, sparingly in cold alcohol, and splitting up in the presence of water and the ferment, myrosin, into grape sugar, acid sulphate of sinipina, and sulphocyanide of acrynil (C_8H_7NSO). This last substance is a nearly colorless, non-volatile oil, is acrid and biting, and irritates the skin when placed in contact with it.

Sinnigrin, or myronate of potassium ($C_{10}H_{18}NS_2KO_{10}$), is obtained from black mustard seed, and forms white, silky needles or glassy prisms, soluble in water, and decomposed in the presence of water and myrosin into sugar, acid sulphate of potassium, and sulphocyanide of allyl or volatile oil of mustard (oleum sinapis). This oil, when pure, is colorless, neutral, slightly soluble in water, freely so in alcohol and ether, and has the specific gravity 1.017.

Sinapina, or sinapine ($C_{16}H_{23}NO_5$), is a readily decomposed alkaloid, found in both white and black mustard, but which has not been isolated in a solid state.

Both white and black mustard yield, by expression, 20 to 25 per cent.

of fixed oil of yellow color, bland taste, and consisting of olein, stearin, and the glyceride of *erucic* acid ($C_{22}H_{42}O_2$).

Uses.—The local use of ground mustard (usually black) in sinapism, or added to the foot or other bath, is, perhaps, so well known as not to require detailed description. Sinapisms are most active when the flour is mixed with cold or lukewarm water. Hot water destroys its activity, and, contrary to common opinion, vinegar renders its action slower or less severe. Mixing with vinegar is a more convenient way of mitigating a sinapism than the common one of adding inert substances, such as wheat flour, flaxseed meal, etc. Sinapisms should never be left in contact with the skin longer than is required to produce redness. This caution is necessary, as when left on too long, as it often is when consciousness is suspended, or the patient does not complain, profound lesions of the skin may result which are not without danger, and are very annoying; severe nervous symptoms are also occasionally produced, especially in women. Ten to fifteen minutes is usually all the time required for application, and on no account should it remain an hour.

Properly used, there is no more useful counter-irritant to relieve nausea, vomiting, cholera morbus, colic, or the chest pains of phthisis, pleuritis, pneumonia, etc. Mustard flour, in teaspoonful doses, stirred up with tepid water, is one of the most reliable emetics for narcotic or other poisoning. White mustard seeds are a popular remedy, given whole, in teaspoonful doses mixed with water, for indigestion and constipation depending on gastro-intestinal atony and deficient secretion. It is given before meals or at night, fasting. There is evidence that their long-continued use has cured cases of obstinate chronic rheumatism.

SODA, NaHO. M. wt. 40. Sodium Hydrate. Caustic Soda.

The pure salt in white, hard fragments, strongly alkaline and corrosive, containing 90 per cent. of sodium hydrate (NaHO), equal to 77.5 per cent. of sodium oxide (Na_2O), and 22.5 per cent. of water (H_2O). It is very deliquescent, and must therefore be kept in well-stopped bottles.

Solubility.—Freely soluble in alcohol and water.

Tests.—*Sulphates*; white precipitate on adding solution of barium chloride or nitrate to an aqueous solution of the soda acidulated with nitric acid. *Chlorides*; white precipitate on adding solution of silver nitrate to solution of the soda acidulated with nitric acid. *Foreign salts*; insoluble residue on dissolving in alcohol.

Preparations.—A solution, $\frac{N}{25}$, *Liquor Sodæ*, as follows:

Take of Sodium hydrate [90 per cent.], *five and six-tenths parts*. 5.6
 Distilled water, sufficient to make *one hundred parts* . 100

Agitate in a glass-stoppered bottle, let stand until the liquid becomes clear by subsidence, and decant the clear liquid into a clean glass-stoppered container. Its specific gravity is about 1.059.

[*Liquor Sodæ*, U. S. P., contains 5 per cent. of sodium hydrate.]

Uses.—Caustic soda is escharotic and applicable as such in similar cases in which potassa is used. It is more manageable than the latter, but is not often used. On account of its causticity, it is rarely employed internally, though its action agrees with that of the more frequently employed carbonates.

Dose.—If internally employed, the dose should not exceed grt. x. to xx. = gm. 0.66 to 1.33 of soda *liquor*, $\frac{N}{25}$.

SODII ACETAS, $\text{NaC}_2\text{H}_3\text{O}_2 \cdot 3\text{H}_2\text{O}$. M. wt. 136. **Acetate of Sodium.**

The pure salt in transparent, prismatic crystals, containing 39.7 per cent. of water, which is lost by exposure to heat, the anhydrous acetate remaining as a white powder. Its taste is cooling and slightly bitter.

Solubility.—Freely soluble in hot and cold water ($3\frac{1}{2}$ parts), and in alcohol ($4\frac{1}{2}$ parts).

Tests.—*Metals*; precipitates with sulphuretted hydrogen and ammonium sulphide. *Sulphate*; white precipitate with nitrate of barium. *Chloride*; white precipitate in dilute solution acidulated with nitric acid, on adding nitrate of silver. *Calcium*; white precipitate with carbonate of sodium.

Uses.—Acetate of sodium is useful as a diuretic in similar conditions to those in which the potassium acetate is commonly employed.

Dose.—Grs. xv. to xl. = gm. 1.00 to 3.00, in solution largely diluted.

SODII ARSENIAS, $\text{Na}_2\text{HAsO}_4 \cdot 7\text{H}_2\text{O}$. M. wt. 312.

Arseniate of Sodium.

The pure salt in transparent, colorless prisms, containing 40 per cent. of water of crystallization. Exposed to dry air, it effloresces, and the white powder resulting contains 16.2 per cent. of water.

Solubility.—Soluble in water (3 parts), glycerine (50 parts); insoluble in alcohol.

Preparations.—A solution, $\frac{N}{100}$, *Liquor Sodii Arseniatis*, as follows:

Heat a convenient quantity of arseniate of sodium until vapor of water ceases to escape, avoiding a temperature exceeding 149° C. (300° F.).

Take of this:

Anhydrous arseniate of sodium, <i>one part</i>	.	.	.	.	.	1
Distilled water, <i>ninety-nine parts</i>	.	.	.	.	.	99

Dissolve the arseniate of sodium in the distilled water.

[Same as U. S. P.]

Uses.—Used for similar purposes as the corresponding potassium salt, preferably in solution $\frac{N}{100}$.

Dose.—Sodii arsenias, *Liquor* $\frac{N}{100}$, gtt. ij. to x. = gm. 0.13 to 0.66.

SODII BENZOAS, $\text{NaC}_7\text{H}_5\text{O}_2$. M. wt. 144. Benzoate of Sodium.

The pure salt in white powder, which is odorless, or with a faint odor of benzoin, but none suggesting that of urine.

Solubility.—Freely soluble in water (1.8 parts), soluble in alcohol (45 parts), insoluble in ether and chloroform.

Tests.—When appearance, odor, and solubility correspond to that above given, it may be considered pure.

Uses.—This salt has been highly lauded as an antipyretic and antiseptic, and useful as a preventive and curative agent in diphtheria, erysipelas, puerperal and other infectious fevers, and in those characterized by periodicity; also by inhalation in phthisis (5 per cent. solution).

The claims of the remedy are not as yet confirmed, but it deserves study.

Dose.—Grs. x. to xv. = gm. 0.66 to 1.00, in solution, every one or two hours. It produces no unpleasant effects.

SODII BICARBONAS, NaHCO_3 . M. wt. 84. Bicarbonate of Sodium.

The pure salt in snow-white powder, representing 36.94 per cent. of sodium oxide (Na_2O), 52.36 per cent. of carbonic acid gas (CO_2), and 10.70 per cent. of water (H_2O). 60 parts of crystallized bicarbonate of sodium neutralize 49.98 parts of citric acid and 53.55 parts of tartaric acid.

Solubility.—Soluble in water (14 parts) and glycerine (8 parts); insoluble in alcohol.

Tests.—*Metals*; dark turbidity on passing sulphuretted hydrogen into its aqueous solution, or on subsequent over-saturation with nitric acid. *Carbonate*; gray color after 24 hours, on agitating two parts

of the bicarbonate with one part of calomel and three parts of water. *Sulphates*; white precipitate on addition of barium nitrate to a solution previously over-saturated with nitric acid. *Chlorides*; white precipitate on adding silver nitrate to a solution previously acidulated with nitric acid. *Alumina*; white, gelatinous precipitate on adding excess of ammonia to a solution of the bicarbonate in excess of warm, dilute hydrochloric acid.

Uses.—Bicarbonate of soda is the most frequently used of the alkaline salts. The alkalinity of the blood and alkaline secretions is chiefly due to salts of soda, and their deficiency or excess is the basis of many morbid actions, including lesions of digestion, nutrition, assimilation, and secretion. A proper amount of alkali in the blood contributes to it the fluidity required to render it fit for endosmosis and exosmosis, promotes the oxidation of sugars, fats, etc., and imparts to the alkaline secretions the properties for which they are peculiar. On the other hand, excess of alkali renders the blood poorer in solids and red corpuscles, renders it paler, and establishes a tendency to emaciation, passive hemorrhages, etc.

These statements indicate the importance of care in the use of alkalies. It is probably a general law (Ringer) that acids applied topically check the production of acid secretions, and alkalies applied to the orifices of glands with alkaline secretions check them. On the other hand, acids increase alkaline secretion, and conversely alkalies increase acid secretion. This law is an excellent guide for the administration of acids and alkalies without impairing digestion, and also for their local use. Functional disorders of the gastro-intestinal tract are the starting-points of diseased conditions in which alkalies are useful. In small doses, given before meals, the gastric acid is increased. Given during or after meals, they neutralize excessive acid when present. If used in excess after eating, alkalies impair digestion by neutralizing the acidity of the gastric juice, and impairing the activity of the secretion from the liver, pancreas, and intestinal glands. Given so as to increase the stomach acid, the latter promotes the biliary, pancreatic, and duodenal secretion, thus facilitating digestion of fats and starches, and relieving so-called "bilious" symptoms.

When an excess of acid from fermentation of food causes intestinal irritation and excessive secretion, alkalies, properly used, give prompt relief. Soda bicarbonate is to be preferred in all these cases, and where there is a deficient alkalinity of the blood, indicated by a white, pasty coat on the tongue, which is broad and pallid. When the urine is acid and irritating, containing excess of uric acid and urates, and there is a

tendency to formation of calculi, soda bicarbonate is a useful agent to render the urine less acid, and promote the solution of concretions or deposits.

Locally, in strong solution, it allays the pains of burns, and in diluted solution, by sponge bath, increases the activity of the skin.

Dose.—Add to water until the taste is evident, and use as a drink.

SODII BORAS, $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$. M. wt. 382.

Borate of Sodium. Borax.

The pure salt in colorless, transparent, hexagonal prisms, containing 47.12 per cent. of water of crystallization, and having a specific gravity of 1.72. It is slightly efflorescent in warm, dry air.

Solubility.—Soluble in cold water (12 to 15 parts), in boiling water (2 parts), and glycerine (1 part, if heated). It is insoluble in alcohol.

Tests.—*Metallic impurities*; coloration or precipitate with sulphuretted hydrogen, or by subsequent acidulation with hydrochloric acid. *Chlorides*; white precipitate with silver nitrate added to a dilute solution previously acidulated with nitric acid. *Sulphate*; white precipitate on addition of barium nitrate to a dilute solution acidulated with nitric acid. *Phosphate*; white, granular precipitate on addition of solution of ammonia magnesium sulphate. *Alum*; white precipitate with sodium carbonate. *Sodium carbonate*; effervescence on addition of an acid.

Preparations.—A glycerite, $\frac{x}{5}$ (*Sodii Boras Glyceritum*), as in Sec. 22, Part I.

[A solution of borax, 1 part, in honey, 8 parts, forms *Mel Sodii Boratis*, U. S. P.]

Uses.—Borax is antiseptic, anti-fermentative, hostile to fungoid growths, and to the lower forms of animal life. These characters, with its weak alkaline reaction, probably account for its efficiency as a local application. It is very useful, locally applied in form of powder, glycerite, or solution in honey, for the cure of aphthæ of the mouth in nursing children, thrush caused by acid fermentation of milk, ulcerative stomatitis, spongy gums, ringworm of scalp, pityriasis, freckles, chloasma, fissures of the nipples, and as a wash in pruritis vaginæ and uterine leucorrhœa. Internally, it is used as a stimulant to mucous surfaces in aphonia and laryngeal congestion, in which cases it may be permitted to dissolve in the mouth, in small portions at a time. It is excreted by the urine, and promotes the secretion of uric acid gravel, and arrests fermentative changes in the bladder, for which purpose it is highly lauded.

Dose.—Grs. v. to xxx. = gm. 0.33 to 2.00, in solution, highly diluted.

SODII BROMIDUM, NaBr. M. wt. 103. **Bromide of Sodium.**

The salt in white granular powder, or anhydrous cubical crystals.

Solubility.—Soluble in water ($1\frac{1}{4}$ parts), and in alcohol (13 parts).

Tests.—*Metals*; precipitates with sulphuretted hydrogen or sulphide of ammonium in the aqueous solution. *Iodides*; blue color on mixing the aqueous solution with recently boiled starch and adding a little chlorine water.

Uses.—This salt is not as active as potassium bromide, but is usefully substituted for that substance in cases of active cerebral congestion, and the reflex cerebral irritations of children during dentition, cholera infantum, or eruptive diseases. Its taste resembles common salt, and it may be conveniently given in milk or food.

Dose.—Grs. j. to xx. = gm. 0.06 to 1.33.

SODII CARBONAS, $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$. M. wt. 286.

Carbonate of Sodium.

The salt in crystalline lumps, or large, colorless, rhombic prisms, containing 62.85 per cent. of water of crystallization, and of decided alkaline reaction; 60 grains neutralize 29.34 grains of citric and 31.47 grains of tartaric acid. Exposed to heat in an iron vessel until vapor of water ceases to be given off, a white powder remains which is anhydrous carbonate of soda. (Sodii Carbonas Exsiccatus, Na_2CO_3 . M. wt. 106.)

Solubility.—Soluble in water (2 parts); insoluble in alcohol.

Tests.—*Chloride*; white precipitate with silver nitrate, when added to a solution of the carbonate acidulated with nitric acid. *Sulphate*; white precipitate when barium chloride is added to a solution of the carbonate acidulated with nitric acid. *Alumina*; white gelatinous precipitate when excess of ammonia is added to a boiling solution of the carbonate in diluted hydrochloric acid.

Uses.—Its uses are identical with those of bicarbonate of sodium, but being stronger it is chiefly employed for external application when an alkali is indicated.

SODII CHLORAS, NaClO_3 . M. wt. 106.5. **Chlorate of Sodium.**

The salt in colorless, transparent, tetrahedral crystals, of cooling, saline taste, and neutral reaction.

Solubility.—Soluble in water (1.1 parts), and alcohol (40 parts).

Tests.—*Potassium*; white crystalline precipitate on adding excess of solution of tartaric acid. *Sulphate*; white precipitate with solution of barium sulphate.

Uses.—Similar to those of potassium chlorate, which it resembles in yielding up its oxygen with explosive violence when triturated with organic substances.

SODII CHLORIDUM, NaCl. M. wt. 58.5. Chloride of Sodium.

The pure salt in white, crystalline powder, permanent in air, neutral to test paper, of specific gravity 2.16, and purely saline taste.

Solubility.—Soluble in water (less than 3 parts), slightly soluble in alcohol.

Tests.—*Sulphate*; white precipitate with barium chloride, when added to its solution acidulated with nitric acid. *Calcium or magnesium*; white precipitate with sodium carbonate. *Metals*; precipitates with sulphuretted hydrogen or sulphhydrate of ammonium.

Uses.—The physiological importance and dietetic uses of common salt are well known. Medicinally, it is extensively employed in solution, by spray or douche, in chronic nasal and pharyngeal catarrh and mercurial sore mouth, as a wash in vaginal leucorrhœa, pruritis vulvæ, and by injection into the rectum to destroy ascarides. It chemically antidotes nitrate of silver. Its internal use, as in saline spring waters, promotes the activity of tissue change and increases the excretion of urica; for this reason they are successfully used in chronic serofulous ailments, affecting the glands, bones, and skin. In moderate amount, it is a grateful and often essential addition to food prepared for the sick, especially when the tongue is broad, pallid, and puffy, with a pasty coat.

SODII HYPOPHOSPHIS, NaH₂PO₂.H₂O. M. wt. 106.

Hypophosphite of Sodium.

The salt as a white, granular, deliquescent powder, of slightly alkaline reaction. Heated in a dry test-tube, it gives off phosphoretted hydrogen, which ignites spontaneously and burns with a bright light, leaving a residue of sodium pyrophosphate reddened with a trace of red amorphous phosphorus. Evaporated with dilute nitric acid and finally ignited, the residue of metaphosphate of sodium should weigh 97 per cent. of the weight of the hypophosphite taken.

Solubility.—Soluble in water and absolute alcohol; insoluble in ether.

Tests.—*Calcium salts*; white precipitate with oxalate of ammonium, and imperfect solubility in absolute alcohol.

Uses.—Used as a restorative and nerve tonic in exhausted states of the system, following or accompanying chronic diseases, and characterized by languor, numbness of the limbs, cold feet, and functional torpor. It is usually associated with other hypophosphites in form of syrup (see *Calcii Hypophos.*), but may be advantageously employed alone, when above symptoms are present.

Dose.—Grs. j. to v. = gm. 0.06 to 0.33, in solution, immediately after eating.

SODII HYPOSULPHIS, $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$. M. wt. 248.

Hyposulphite of Sodium.

The salt in large, transparent, colorless, right rhombic prisms, which effloresce in dry air, are readily fusible by heat, and contain 36.29 per cent. of water of crystallization.

Solubility.—Soluble in cold water ($1\frac{1}{2}$ parts), insoluble in alcohol. It dissolves with decomposition in strong acids.

Tests.—*Sodium carbonate*; effervescence when a concentrated solution is dropped into dilute acetic acid. *Sodium sulphate*; white precipitate on adding barium nitrate to a dilute solution of the salt.

Uses.—Hyposulphite and sulphite of sodium may be regarded as identical in action, as sulphurous acid is evolved from both, by contact with the acid of the stomach, and they are both partly absorbed and eliminated as sulphate of sodium, which results from their oxidation. They share with sulphurous acid its well-known power of destroying bacteria, fungi, etc., of arresting or preventing fermentation, and of deodorizing the putrid products of decomposition, either within or without the body. In dyspeptic disorders, characterized by flatulence and acidity, due to fermentation, and accompanied by the rapid development of vegetable organisms of a low order, these salts are very efficacious. This destructive action on microscopic organisms liable to develop during the depressed condition of vital resistance, present in many diseases, probably accounts for the efficacy of these salts in such cases. The local use of these compounds to deodorize foul-smelling discharges from wounds, or from the vagina, uterus, rectum, or bladder, is their most important application. It is often very efficacious as a lotion in parasitic skin diseases.

A five per cent. solution is of great utility to destroy the odor of

offensive lochiæ; it may be used as an injection, or to moisten the napkins in which the discharges are removed.

Dose.—Grs. x. to xv. = gm. 0.66 to 1.00, in solution, largely diluted.

SODII IODIDUM, NaI. M. wt. 150. Iodide of Sodium.

The pure salt in anhydrous, deliquescent cubes, of white color, saline somewhat acrid taste.

Solubility.—Soluble in water, alcohol, and glycerine.

Tests.—*Chloride, bromide, and carbonate* may be detected in the same manner as when present in potassium iodide. Sodium iodide may be distinguished from potassium iodide by yielding no precipitate with an excess of tartaric acid, and by coloring an alcohol flame yellow.

Uses.—Used as a substitute for potassium iodide when the tongue and mucous surfaces are pallid, and there is evidence of enfeeblement of circulation.

Dose.—Grs. j. to xv. = gm. 0.06 to 1.00.

SODII NITRAS, NaNO₃. M. wt. 85. Nitrate of Sodium.

The pure salt in transparent, colorless, anhydrous, slightly deliquescent, obtuse rhombohedral crystals. It yields no precipitate on addition of solution of sodium bitartrate, which distinguishes it from potassium nitrate. Heated to redness with excess of sulphuric acid until vapors cease to be evolved, a residue of 83.5 per cent. of the amount heated remains.

Solubility.—Freely soluble in water, slightly so in alcohol.

Tests.—*Sulphate*; white precipitate with barium nitrate. *Chloride*; white precipitate with silver nitrate. *Potassium*; white granular precipitate with solution of sodium bitartrate. *Earthy salts*; white precipitate with sodium carbonate. *Metals*; precipitates with sulphuretted hydrogen or sulphide of ammonium.

Uses.—Although it has been used in a large variety of diseases, the utility of nitrate of soda is well defined in but a few conditions. In chronic rheumatism and lumbago, when the urine is scanty, high-colored, and becomes turbid on cooling, its use will increase the urine, rendering it clear, which result is usually followed by the decline of pain. In acute diseases where the mucous surfaces are puffed and covered with white or yellowish fur, the urine being of the character above indicated, the remedy will prove a useful one.

Dose.—Grs. v. to xv. = gm. 0.33 to 1.00, every two or three hours, in solution, largely diluted.

SODII PHOSPHAS, $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$. M. wt. 358.

Phosphate of Sodium.

The pure salt in transparent, colorless crystals of the oblique prismatic system; specific gravity 1.55, slightly alkaline reaction, cooling saline taste, and containing 60.10 per cent of water of crystallization. The crystals effloresce in dry air, and, if heated slowly to redness, leave a residue of pyrophosphate of sodium ($\text{Na}_4\text{P}_2\text{O}_7$), weighing 37.2 per cent. of the original amount taken.

Solubility.—Soluble in water (6 parts), insoluble in alcohol.

Tests.—*Carbonate*; effervescence with acids. *Metals*; colored precipitates with sulphuretted hydrogen from solution acidulated with hydrochloric acid. *Sulphates*; white precipitate from solution of the salt strongly acidulated with nitric acid, on addition of barium nitrate. *Chlorides*; white precipitate from solution acidulated with nitric acid on addition of silver nitrate.

Uses.—Phosphate of soda has some value as a restorative when the indications exist for alkalies and there is imperfect assimilation of food, constipation, etc. Its most important use, however, is as a laxative, and as a remedy for duodenal catarrh and diseases directly traceable to the presence of that condition. It prevents inspissation of the bile and mucus with crystallization of cholesterin in the gall-duct, and will thus remove the cause of many cases of jaundice, hepatic colic, bilious headache, and imperfect assimilation of fats from lack of bile.

Dose.—Grs. v. to xxx. = gm. 0.33 to 2.00, in water or milk, three times per day.

SODII PYROPHOSPHAS, $\text{Na}_4\text{P}_2\text{O}_7 \cdot 10\text{H}_2\text{O}$. M. wt. 446.

Pyrophosphate of Sodium.

The pure salt in translucent, prismatic crystals, without odor, of feebly alkaline taste and reaction.

Solubility.—Soluble in water (12 parts), insoluble in alcohol.

Tests.—*Carbonate*; effervescence on adding an acid to solution. *Metals*; precipitate or discoloration of solution with sulphuretted hydrogen or ammonium sulphide.

Uses.—For the preparation of Ferri Pyrophosphas. It has no direct medicinal uses.

SODII SALICYLAS, $\text{NaC}_7\text{H}_4\text{O}_3 \cdot \text{H}_2\text{O}$. M. wt. 338.**Salicylate of Sodium.**

The pure salt in white, crystalline scales, which, when incinerated, yield 31 per cent. of residue.

Solubility.—Soluble in water ($\frac{1}{2}$ part), less freely in alcohol (6 parts), slightly in ether.

Tests.—The aqueous solution (1 in 10) is slightly acid, yields a red-brown color on addition of solution of ferric chloride, and a precipitate, completely soluble in ether, with hydrochloric acid. *Chlorides*; white turbidity when nitrate of silver is added to solution mixed with sufficient alcohol to prevent precipitation, and acidulated with nitric acid. *Sulphate*; white precipitate when barium nitrate is added to aqueous solution.

Uses.—The most useful application of this remedy is for the reduction of temperature and mitigation of the pain of rheumatic fever, both of which are rapidly accomplished under its employment. Its use should be suspended as soon as the pain ceases, but the patient must be carefully watched to prevent imprudent exposure, and consequent unpleasant complications or relapse.

(See *Salicine* and *Salicylic Acid*.)

Dose.—Grs. x. = gm. 0.66, in solution, every hour, lengthening the interval or suspending the remedy as the pain ceases.

SODII SULPHAS, $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$. M. wt. 322. **Sulphate of Sodium.**

The salt in transparent, colorless, six-sided, oblique prismatic crystals, which contain 55.9 per cent. of water of crystallization, effloresce in dry air, are neutral, and have a cooling, saline, and bitter taste.

Solubility.—Soluble in water (3 parts), insoluble in alcohol.

Tests.—*Metals*; characteristic precipitates with ammonium sulphide. *Chloride*; white precipitate, insoluble in nitric acid with silver nitrate. *Ammonium salts*; odor of ammonia when heated with potassium hydrate. *Calcium and magnesium salts*; white precipitates with sodium carbonate.

Uses.—Used as a cooling, saline purgative or laxative, according to dose and degree of dilution. In weak solution it is frequently beneficial in diarrhœa, dysentery, and some chronic skin diseases.

Dose.—Grs. xxx. to ʒiv . = gm. 2.00 to 16.00, dissolved in a goblet of water.

SODII SULPHIS, $\text{Na}_2\text{SO}_3 \cdot 7\text{H}_2\text{O}$. M. wt. 252. **Sulphite of Sodium.**

The pure salt in colorless, transparent, prismatic crystals, which effloresce in dry air and contain 50 per cent. of water of crystallization, or the same salt in the anhydrous form (granular), prepared by drying the crystals at a gentle heat until the water of crystallization is expelled. The latter form of the salt is the most permanent.

Solubility.—The crystals are soluble in water (4 parts), and slightly soluble in alcohol.

Tests.—*Sulphate*; white precipitate with barium chloride, which, after washing with water, is insoluble in diluted hydrochloric acid. *Hyposulphite*; precipitate of sulphur on addition of sulphuric acid.

Uses.—The uses of this drug are described under *Sodii Hyposulphitis*, with which it corresponds in its therapeutic applications.

Dose.—Grs. x. to xxx. = gm. 0.66 to 2.00, in solution, largely diluted. The addition of a few grains of common salt disguises the sulphurous taste of the sulphite.

SODII SULPHOCARBOLAS, $\text{NaC}_6\text{H}_5\text{SO}_4 \cdot 2\text{H}_2\text{O}$. M. wt. 232.**Sulphocarbolate of Sodium.**

The pure salt in transparent, rhombic, prismatic needles.

Solubility.—Soluble in water (5 parts), alcohol (132 parts), and glycerine; insoluble in ether.

Tests.—*Sulphate*; white precipitate, insoluble in nitric acid on addition of barium chloride.

Uses.—On theoretical grounds, this and corresponding salts of ammonium, potassium, magnesium, and zinc have been administered internally in typhoid and eruptive fevers, phthisis, diphtheria, and other diseases in which a septicæmic tendency is recognized or feared. It does not appear that their usefulness in these cases is proven. They all possess much of the disinfecting power of carbolic acid without its irritant properties, and may therefore be employed locally by spray, wash, or gargle, in fetid and gangrenous conditions of accessible tissues.

Dose.—*Sodii sulphocarbolas*, grs. v. to xv. = gm. 0.33 to 1.00, in solution, for internal use.

Locally, two to five per cent. solutions for ordinary use. Saturated solutions may be applied topically to exudations which are the seat of fetid decomposition.

SODIUM, Na. At. wt. 23. **Sodium.**

The pure element (Natrium, symbol Na); specific gravity 0.97, silver-gray color, consistence of wax, and strongly metallic lustre when freshly cut. It oxidizes rapidly in contact with air, for which reason it is kept under petroleum naphtha. It decomposes water when brought in contact with it, hydrogen being given off with a hissing noise as the sodium swims about on the surface, sodium hydrate (NaHO) being formed and dissolved.

Uses.—The element itself is not used in medicine, but its compounds are of much importance. It is directly used for the preparation of Sodium ethylate (which see).

SODIUM ETHYLATE, $\text{C}_2\text{H}_5\text{NaO}$. M. wt. 76. **Caustic Alcohol.**

A solution of sodium ethylate prepared as directed below.

Preparation.—

Take of Absolute alcohol, specific gravity, 0.795, *one part* . . . 1
Sodium, *a sufficient quantity* q.s.

Place the alcohol in a test-tube or beaker-glass, of a capacity equal to 4 parts, set it in a water-bath of a temperature 10°C . (50°F .), and add cuttings of sodium, in small portions at a time, until hydrogen ceases to be given off; then raise the temperature to 37.8°C . (100°F .), and add a few additional pieces of sodium until the evolution of hydrogen finally ceases. Permit the compound to cool down to 10°C . (50°F .), and add to the gelatinous residue

Absolute alcohol, *one part* 1

Uses.—Caustic alcohol was recently introduced as a manageable caustic for medical and surgical use. It absorbs water from the tissue to which it is applied, caustic soda being formed, gradually destroying the part; the liberated alcohol coagulates the albuminous compounds in the vicinity to which it is applied, and thus limits the caustic action of the soda and prevents the decomposition of the dead products of disintegration. Severe pain can be controlled by the occasional dropping on to the part of a little chloroform, or by destroying its sensibility by ether-spray prior to the application of the caustic. By diluting the ethylate with alcohol the risk of hemorrhage from too rapid action is much lessened, as the alcohol promotes coagulation. It is deserving of careful study.

SOLANUM NIGRUM. Black Nightshade.

The fresh herb beginning to flower.

Solanaceæ.

Linné.

Constituents.—An alkaloid, *solanina*, is said to be present and to be the source of its poisonous properties; but no careful analysis has been made.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Outside of the homœopathic school it has been but little used. It strongly resembles belladonna in its properties and should be studied.

Dose.—Use in same dose and manner as belladonna (which see).

SOLIDAGO ODORA. Sweet-scented Golden Rod.

The fresh leaves and tops.

Compositæ, Asteroideæ.

Aitkin.

Constituents.—A volatile oil, *Oleum Solidago*, of aromatic, anise-like odor, pale greenish-yellow color, and lighter than water, is the only important constituent.

Preparations.—From the leaves and tops.

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

The volatile oil obtained by distillation with water.

A tincture, $\frac{N}{10}$, of the oil with alcohol, as in Sec. 46, Part I.

Uses.—This plant is distinguished by its odor and aromatic taste (suggesting anise or fennel), from the large number of species of the same genus found in this country. It is mildly stimulant to the nervous and vascular systems, and may be usefully employed to allay menstrual or other colics, promote perspiration, and relieve headache. The oil or its tincture exerts a local anodyne influence in neuralgia and rheumatism.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent.

Oil, gtt. j. to v. = gm. 0.06 to 0.33, or equivalent.

SOPHORA SPECIOSA. Sophora.

The seeds.

Leguminosæ, Papilionaceæ.

Bentham.

Constituents.—A peculiar principle has been isolated and named *sophoria*. It is nearly white, amorphous, soluble in alcohol, chloroform, ether, and dilute acids, and is probably an alkaloid.

Uses.—In large doses this drug depresses the reflex functions of the cord, impairs the power of voluntary movement, and causes disturbance of respiration, vomiting, convulsions, and loss of consciousness. These effects have resulted in experiments on animals. It is stated that

sophora beans are sometimes used by the Indians in south-west Texas as an intoxicant, and that this effect is followed by profound sleep of several days' duration. From this it would appear that in small doses its exhilarating influence may be utilized in some diseased conditions. A whole bean has proved fatal to man. It is a powerful drug, and worth cautious study.

A trituration (Sec. 49, Part I.) is suggested as a convenient form for study.

A tincture ($\frac{N}{5}$, with alcohol), from the seeds of *S. Japonica*, a tree native of China or Japan, is employed in homœopathic practice.

SORBUS AMERICANA. Mountain Ash.

The fresh bark. (*Pyrus Americana*, D. C.)

The fruit.

Rosaceæ, *Pomeæ*.

Linné.

Constituents.—The berries of a European species, *S. acuparia*, contain acrid, bitter, and coloring principles, tannin, a fermentable sugar, citric, malic, and tartaric acids, and a peculiar, non-fermentable sugar, *sorbin* ($C_{12}H_{24}O_{12}$). The berries of the American species probably have similar constituents. The bark somewhat resembles that of *Prunus Virg.*, contains amygdalin, but is more astringent from the presence of a large amount of tannin.

Preparations.—From both bark and berries.

A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Used for its astringent influence to restrain excessive discharges and constrict relaxed mucous tissues. Special applications of the drug may appear upon restudy. It is chiefly employed in decoction, infusion, or poultice, but the tinctures are suggested for trial.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to 3j. = gm. 0.33 to 4.00, or equivalent.

SPIGELIA MARILANDICA. Pinkroot.

The recent root.

Loganiaceæ.

Linné. Bentley and Trimen.

Constituents.—A bitter principle, soluble in alcohol and water, insoluble in ether, but whose real nature is not clear. A little volatile oil, resin, tannin, and wax are the constituents of interest.

Preparations.—A tincture, $\frac{N}{1}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—Chiefly employed as an anthelmintic, for which it is quite efficacious; it is usually associated with a purgative for the purpose. Nervous depression and irritability, with fever simulating that produced by worms, but really due to a catarrhal derangement of the intestinal canal, will often be promptly relieved by small doses.

Spigelia anthelmia, or Demerara pinkroot, is employed in form of tincture of the dried herb ($\frac{N}{5}$, with alcohol) in neuralgic affections of the eyes and teeth, and in rheumatic affections of the heart, characterized by violent action, dyspnoea, oppression, and irregular pulse; also in verminous diseases. The American species is not so poisonous, but is worthy of study for similar conditions.

Dose.—S. Mar., *Tincture* $\frac{N}{1}$, gtt. j. to xxx. = gm. 0.06 to 2.00, or equivalent.

SPILANTHES OLERACEA. Para-Cress.

The dried herb in flower.

Compositæ, Senecionideæ.

Jacquin.

Constituents.—A small amount of *volatile oil*, an *acid*, *soft resin*, a crystallizable principle, *spilanthin*, soluble in ether and alcohol, insoluble in water, are, with *tannin*, the constituents said to be present.

Preparations.—A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I. (Equivalent to homœopathic tincture.)

Uses.—This plant is of South American origin. It has an acrid taste; and provokes secretion from the salivary glands and by the kidneys. It is said to be efficacious in rheumatic, gouty, and calculous affections, and as a diuretic in dropsy. Applied on cotton to decayed teeth, it promptly relieves the pain, for which purpose it is chiefly used.

The drug is seldom used in this country.

SPIRÆA TOMENTOSA. Hardhack.

The fresh plant, collected when in flower.

Rosacæ, Rosæ.

Linné.

Constituents.—Its astringency indicates the presence of some form of tannin, but the plant has not been analyzed.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—After the subsidence of the acute symptoms in mucous, serous, or hemorrhagic fluxes involving the intestinal tract, hardhack will be found an efficacious astringent and tonic, deserving of more attention than it has hitherto received. It rarely disagrees with sensitive stom-

achs. Locally, in diluted tincture, it will be found useful as a wash to ulcers, or by injection in leucorrhœa, etc.

S. ulmaria, a more aromatic herbaceous species of *Spiræa*, may be prepared and used in the same manner as the drug described.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

SPIRITUS ÆTHERIS NITROSI. Spirit of Nitrous Ether.

A transparent, nearly colorless, or slightly greenish-yellow liquid, containing five per cent. of ethyl nitrite or nitrous ether ($C_2H_5NO_2$), held in solution by alcohol. It has a specific gravity of 0.825, an aromatic, sweet taste, fragrant ethereal odor, and neutral reaction with litmus paper.

Solubility.—Freely miscible with water, ether, alcohol, carbon bisulphide, benzol, chloroform, and oils.

Tests.—*Acids*; reddening of blue litmus paper, or bubbles of carbonic acid gas on addition of crystals of potassium bicarbonate. *Ethyl chloride*; white precipitate, insoluble in nitric acid on addition of silver nitrate to the residue left after burning a little of the spirit on a small quantity of water in a capsule. *Aldehyde*; brown color on agitating a small amount of the spirit with a fragment of potassium hydrate.

Uses.—Used as a mild stimulating diuretic in cardiac dropsy, especially in children. In slight febrile attacks, such as are caused by arrest of perspiration, it promotes cutaneous activity, and moderates the excessive action of heart and arteries.

Dose.—Gtt. x. to xxx. = gm. 0.66 to 2.00, well diluted, repeated every one-half to one hour in fever. As a diuretic, about double the dose may be used, every three or four hours.

SPONGIA OFFICINALIS. Sponge.

Turkish sponge in cup-shaped pieces, thoroughly purified of sand and calcareous matters by heating and treatment with diluted hydrochloric acid.

Class, Poriphera; *Order*, Ceratos spongiæ.

Linné.

Constituents.—*Spongin*, a proteid matter soluble in hot solutions of potassium hydrate and hot mineral acids, forms the chief organic constituent of sponge. Sand and calcareous matters are also present in the unpurified sponge.

Uses.—The domestic and surgical uses of sponge are well known. Too great care cannot be exercised in keeping them pure and sweet, to

insure which they should always be thoroughly cleansed (especially after surgical uses) with boiling water before drying. Saturating them with an aqueous solution of thymol or other antiseptic before drying, lessens the danger of infection when subsequently used.

When employed for dilatation, the sponge is cut while moist into elongated pieces, tied with twine into desired shape, and then dried. Sponge tents may be prepared with facility by saturating the damp sponge with mucilage of gum-arabic containing an antiseptic or other medicament, wrapping with thread to the desired shape, drying, removing the thread and coating with wax, glycerite of starch, or even glycerine, before use.

Spongia (*spongia marina tosta*) of homœopathic practice is prepared by roasting (not burning) sponge in a closed vessel and making into tincture ($\frac{N}{5}$ with alcohol). It is employed in laryngeal and tracheal disorders, characterized by hoarseness, with hard, dry, barking cough, by sudden feeling of suffocation with pain or oppression in the cardiac region; also in bronchocele and inflammatory swelling of testes or ovaries.

STATICE LIMONIUM. Marsh Rosemary.

The recent root (variety, *Caroliniana*. Gray).

Plumbaginaceæ.

Linné. Bentley and Trimen.

Constituents.—*Tannin* (14 to 18 per cent.), traces of *volatile oil*, *gum*, a *caoutchouc-like substance*, and *earthy salts*, are the important constituents.

Preparations.—A tincture, $\frac{N}{1}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—A powerful and useful astringent in ulcerated, aphthous, or catarrhal conditions of mucous surfaces, applicable when such an influence is needed. Some antiseptic power is claimed for it.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xxx. = gm. 0.33 to 2.00, or equivalent, or locally as a wash, gargle, or injection.

STICTA PULMONARIA. Sticta.

The fresh lichen.

Lichens.

Linné.

Constituents.—The plant has not been examined.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

[The homœopathic tincture represents one-half its weight of the fresh drug.]

Uses.—*Sticta* is a valuable remedy in rheumatic and catarrhal affections, such as are caused or aggravated by sudden changes of temperature. The rheumatic pains usually involve the joints and neighboring muscles, are drawing, somewhat spasmodic, and accompanied with more or less redness or swelling. The small joints are usually involved, though all may be. The catarrhal disorders are characterized by headache, with darting pains through the vertex, side of face, and lower jaw, pressure in forehead at root of nose, sneezing, coryza, conjunctivitis, soreness and dull pain in chest, aggravated by full inspiration, exhausting cough, etc. The catarrhal disorder may be preceded by rheumatic pains, and their sudden suppression is often followed by return of the rheumatism.

The drug is deserving of close study.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent, to water $\tilde{\text{z}}$ iv. = (gm. 128.00). Teaspoonful doses (gm. 4.00).

STILLINGIA SYLVATICA. *Stillingia*.

The recent root.

Euphorbiaceæ.

Linné. Bentley and Trimen.

Constituents.—An *odorous principle* and acrid *oleo-resinous matter*, soluble in alcohol, are present, but as no careful analysis has been made, their true nature is not clear.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

An oleo-resin, $\frac{4N}{1}$, with alcohol, as in Sec. 25, Part I.

Uses.—*Stillingia* is stimulant to the vegetative nervous system, through which it influences the lymphatics, their glands, the mucous membranes, and skin. It has been extensively employed as an “alterative,” but usually mixed with other remedies in such manner as to obscure its special action. Torpor of the lymphatics and of the glands of both secretion and excretion, characterizes the cases in which it is most useful. This condition is indicated by enlargement of cervical glands, deficiency of secretion from mucous surfaces, which are turned red and glistening; laryngeal irritation, hoarseness and cough, deficient hepatic and intestinal secretion; constipation, stools clay-like; exostoses, with periosteal pain, especially in long bones; eruptions of the skin of a tubercular character, ulcerating readily, and discharging unhealthy pus.

Chronic laryngitis, rheumatic, serofulous, and syphilitic diseases are often benefited by its use.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

The oleoresin may be usefully employed in form of trituration with sugar of milk (gtt. j. to grs. ix.).

STRYCHNIA, $C_{21}H_{22}N_2O_2$. M. wt. 334. Strychnia.

The pure alkaloid in colorless, transparent, small octahedral crystals, or in white, crystalline powder. It is inodorous, and intensely bitter and poisonous.

Solubility.—Soluble in chloroform (5 parts), glycerine (300 parts), 80 per cent. alcohol (120 parts); slightly in water (6700 parts), absolute or dilute alcohol, insoluble in ether. It dissolves to some extent in fixed and volatile oils, benzol, and amylic alcohol, and freely with formation of neutral salts in dilute acids.

Tests.—Impurities in strychnia or its salts :

Brucia, veratria, morphia, or its salts or salicin; red or purplish-red solutions when treated with a few drops of cold concentrated nitric or sulphuric acids, in which, when pure, the strychnia dissolves without any such color. *Cinchona alkaloids*; white precipitate with solution of potassium bicarbonate when added to a solution of strychnia (1 gr. to 3j.) in diluted sulphuric acid. Strychnia gives no precipitate with this reagent. *Inorganic matters*; a residual ash on incineration.

Uses.—Strychnia and its salts are chiefly used in cases in which there exists anæmia of the cord with consequent functional depression. Old cases of hemiplegia, the muscles being flaccid, but with their nutrition and electro-contraction unimpaired, paraplegia, in the absence of evidence of acute inflammatory or structural changes in the cord, hysterical and reflex paraplegia, paralysis of muscles of lower extremities, due to spinal concussion or to rheumatic or syphilitic affections of its meninges (after subsidence of local diseased process), constipation, due to paresis of the intestinal muscular coats, diphtherial paralysis, local paralysis, as of bladder or sphincter ani, dropwrist, lead colic, paralysis of vocal cords, facial paralysis, amaurosis, and the various paralytic affections of ocular muscles, when of functional origin, chorea, and cases of idiopathic epilepsy, with pallor or anæmia of the retina, all present conditions in which strychnia may be employed with benefit. In wandering neuralgic pains, debility, and nervous prostration, with poor circulation, feeble action of the heart and small pulse, easily disturbed by emotional causes, exercise, or derangement of digestion, in all of which there

exists motor depression or impairment of nutrition of nerve-centres, the use of strychnia may prove beneficial.

Evidence, which seems conclusive, has been adduced that strychnia has proven curative in cases of traumatic tetanus. The history of these cases shows that the remedy was given in enormous doses, sufficient perhaps to cause prompt motor paralysis from exhaustion, and thus prevent death from respiratory spasm, the usual cause. The treatment simply suppresses the spasms, without overcoming the hyperæmia of the cord, which causes them, and if recovery takes place at all it is owing to extraordinary vital resistance, and not to any direct curative influence of the drug. The method seems justifiable only when all others prove futile.

With reference to strychnia in attenuated doses, see *Nux Vomica*, with whose action it is identical, except that it more directly influences the cord and is less appropriate in visceral derangements.

Dose.—Of the sulphate, grs. $\frac{1}{100}$ to $\frac{1}{30}$, in pill or trituration. One-half this amount of other salts.

Minute doses in trituration, $\frac{N}{102}$ to $\frac{N}{106}$ (Sec. 49, Part I.).

STRYCHNIÆ HYDRIODAS, $C_{21}H_{22}N_2O_2.HI$. M. wt. 462.

Hydriodate of Strychnia.

The pure salt in quadrangular needles or white scales, containing 72.3 per cent. of strychnia.

Solubility.—Soluble in alcohol and sparingly in water.

For tests, uses, and dose, see *Strychnia*.

STRYCHNIÆ HYDROBROMAS, $C_{21}H_{22}N_2O_2.HBr$. M. wt. 415.

Hydrobromate of Strychnia.

The pure salt in prismatic needles, containing 80 per cent. of strychnia.

Solubility.—Sparingly soluble in alcohol, readily so in diluted alcohol, and in water (32 parts).

For tests, uses, and dose, see *Strychnia*.

STRYCHNIÆ HYDROCHLORAS, $2(C_{21}H_{22}N_2O_2.HCl).3H_2O$.

M. wt. 795. Hydrochlorate of Strychnia.

The pure salt in silky needles, containing 84 per cent of strychnia.

Solubility.—Soluble in alcohol, and in water (50 to 60 parts).

For tests, uses, and dose, see *Strychnia*.

STRYCHNIE NITRAS, $C_{21}H_{22}N_2O_2HNO_3$. M. wt. 397.

Nitrate of Strychnia.

The pure salt in colorless, silky needles, containing 84 per cent. of strychnia.

Solubility.—Soluble in glycerine (26 parts), and moderately so in alcohol, and in water (80 parts).

For tests, uses, and dose, see *Strychnia*.

STRYCHNIE SULPHAS, $(C_{21}H_{22}N_2O_2)_2H_2SO_4 \cdot 7H_2O$. M. wt. 892.

Sulphate of Strychnia.

The pure salt in small, colorless, prismatic crystals, which effloresce slightly on exposure and become somewhat opaque. They contain 14.1 per cent. of water of crystallization, and 74.88 per cent of strychnia.

Solubility.—Soluble in water (10 parts), glycerine (26 parts), and in alcohol (60 parts); insoluble in absolute alcohol and ether.

For tests, uses, and dose, see *Strychnia*.

STYRAX. Stórax.

The balsam prepared from the bark of Liquidamber orientale, *Miller*, *L. imberbe*, *Aiton*.

Hamamelaceæ, *Balsamifluæ*.

Bentley and Trimen.

Constituents.—*Styrol*, or *cinnamene* (C_8H_8), is a fragrant volatile liquid, which is colorless, of burning taste, specific gravity 0.924, and soluble in alcohol and ether; *cinnamic acid* ($C_9H_9O_2$), which is colorless, crystalline, soluble in alcohol, and somewhat so in water; *styracin*, or styryl (cinnamyl), cinnamate ($C_9H_9, C_9H_7O_2$), crystalline, soluble in ether, sparingly so in alcohol, insoluble in water, and *two resins*, are the important constituents.

Solubility.—The pure balsam should be soluble in alcohol, in ether, chloroform, and most essential oils.

Tests.—Commercial storax contains variable amounts of water (10 to 20 per cent.), and fragments of bark with inorganic impurities (13 to 18 per cent.). Turpentine may be detected by agitating an alcoholic solution of the balsam with benzine, separating this liquid and evaporating it. The odor of turpentine will, if present, be detected in the residue.

Uses.—Storax is analogous in its uses to balsams of copaiba, tolu, and Peru, particularly the latter. Chronic catarrhal conditions of the respiratory organs, and similar conditions of the genito-urinary tract,

may be benefited by its internal employment. Locally applied, thinned with alcohol, olive oil, or both, it is an efficacious remedy for scabies. It should be preceded and followed by a warm bath. Bals. Peru is sometimes mixed with it. Locally applied, it stimulates and purifies offensive ulcers, etc. (See *Bals. Peru.*)

Dose.—Grs. v. to xxx. = gm. 0.33 to 2.00.

SULPHUR, S. At. wt. 32. Sulphur.

Sulphur precipitated by muriatic acid from calcium sulphide and hyposulphite (Sulphur Præcipitatum).

Sulphur sublimed and condensed in a fine powder (Sulphur Sublimatum).

Sulphur sublimed, thoroughly washed with distilled water until the liquid has no acid reaction, and then dried (Sulphur Lotum).

Solubility.—Soluble in carbon bisulphide (except the amorphous and prismatic varieties, which are somewhat present in freshly sublimed sulphur, but change with age into the soluble octohedral form, specific gravity 2.045), somewhat so in benzol, chloroform, warm or boiling oil, turpentine, essential and fatty oils, and freely and completely in boiling solutions of potassium and sodium hydrates. It is nearly insoluble in alcohol and ether, entirely so in water.

Tests.—*Mineral and fixed impurities*; residue on expulsion of sulphur by strong heat in a crucible or on platinum foil, or imperfect solubility in boiling solution of potassium or sodium hydrate. *Resinous matters*; sooty flame on ignition, or resinous residue on evaporation of alcohol which has been agitated with some of the sulphur. *Arsenic*; yellow precipitate on over-saturating with hydrochloric acid, a solution of ammonium sesquicarbonate which has been digested with the sulphur for an hour. *Starch*; blue coloration with solution of iodine when added to a portion which has been boiled in water.

Preparations.—A trituration from washed sulphur, as in Sec. 49, Part I.

An ointment, $\frac{3\text{X}}{100}$, as follows:

Take of Sulphur sub., <i>thirty parts</i>	. . . . .	30
Benzoinated lard, <i>seventy parts</i>	. . . . .	70

Rub the sulphur, with the lard gradually added, until they are thoroughly mixed.

Uses.—When taken internally, through the agency of the alkaline secretions of liver and pancreas, sulphur is partly absorbed in the form of sodium sulphide, the remainder passing off unchanged. After ab-

sorption, the sulphur of this compound is partly oxydized into sulphates which are excreted by the urine, and the remainder combines with hydrogen, the sulphuretted hydrogen thus formed escaping by the skin and pulmonary surfaces. While, therefore, the remedial results of the administration of sulphur are usually considered those of the element, they are, strictly speaking, due to the sulphides formed in the intestinal canal. These compounds, in small amounts, increase the secretions of the intestinal mucous membrane and operate as laxatives, but when long continued, or if present in large amounts, cause diarrhœa. When absorbed in the circulation in minute amounts they stimulate, but in large amounts they depress the ganglionic or vegetative nervous system, and through it the capillary circulation throughout the body. The influence of small doses is obtained by administering sulphur in amounts so minute as to be completely absorbed, as above explained, and is of the greatest usefulness in affections of the skin, mucous membranes, portal system, and glandular apparatus, to antagonize the stagnation or impairment of the capillary circulation in their tissues which causes the various engorgements, exudations, suppurations, eruptions, and aberrations of secretion to which they are subject. This method of employing sulphur has not received the study and attention it deserves, except among homœopathic practitioners. The writers of that school claim that it is useful in almost all chronic and some acute diseases, but especially in chronic affections of scrofulous nature, those affecting persons who have previously suffered with ulcers, eruptions, etc., in skin diseases characterized by itching increased by warmth, and in catarrhal states of mucous surfaces following the suppression of an eruption. To enumerate the diseases in which sulphur has been employed would be useless, but a close study of each will probably show that the depression of the ganglionic nervous system, and of the capillary circulation above alluded to, is the "basic lesion" in each case.

Perhaps the best known use of sulphur is that of its local application in ointment for the cure of scabies. It should be used in ointment, applied with brisk friction, and its application preceded and followed by warm baths.

The utility of natural sulphur waters is due to sulphuretted hydrogen and other sulphides.

Dose.—In trituration, $\frac{N}{10}$ to $\frac{N}{100}$, grs. j. to v. = gm. 0.06 to 0.33.

As a laxative, washed sulphur, grs. xxx. to ʒj. = gm. 2.00 to 4.00 in syrup or milk.

SUMBUL. Musk Root.

The dried root of *Ferula* (*Euryangium*, *Kauffman*) *Sumbul*.

Umbellifera, *Orthospermæ*. J. D. Hooker. Bentley and Trimen.

Constituents.—*Volatile oil*, *balsamic resin*, *angelic* and *valerianic* acids, a *bitter substance*, and an alkaloid, *sumbulina*, all soluble in alcohol, are said to be present, but the constituents require further study.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—This remedy directly influences the cerebro-spinal nerve centres, controlling the spasm, restlessness, and incoördination of movement due to disturbances of their circulation. Its resinous and volatile constituents are excreted by the mucous surfaces of the kidneys and air-passages, stimulating their vessels, and controlling excessive secretion. Neuralgias, facial, ovarian, and sciatic, occurring in hysterical cases, and accompanied with the motor disturbances alluded to, are often promptly relieved; also useful to control nervousness, sleeplessness, with a tendency to spasm, palpitation of the heart, asthma, spasmodic and catarrhal, and in catarrhal states of the pulmonary and genito-urinary tracts. It resembles musk in its odor, and in many of its medical properties.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

SYMPHYTUM OFFICINALE. Comfrey.

The fresh root.

Boraginaceæ.

Linné. Gray.

Constituents.—*Asparagin* in small amount, a little *tannin*, *sugar*, and a large amount of *mucilage*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—A feeble remedy. It has long been used in the treatment of irritable conditions of pulmonary, genito-urinary, and gastro-intestinal mucous surfaces, as hæmaturia, hæmoptysis, dysentery, metrorrhagia, etc. It is slightly astringent, but "demulcent" properties due to its mucilage probably account for its use in the condition named. It is possible that asparagin imparts some virtues not otherwise accounted for.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

TABACUM. Tobacco.

The dried leaves of *Nicotiana Tabacum*.

Solanaceæ.

Linné. Bentley and Trimen.

Constituents.—*Nicotina* or *nicotia* ($C_{10}H_{14}N_2$), a colorless, oily

alkaloid, of burning taste, pungent odor, strong alkaline reaction, specific gravity 1.027, freely soluble in water, alcohol, and ether, and forming neutral and acid salts with acids; *nicotianin*, which may be separated by distillation as a camphor-like body, in foliaceous crystals of bitter and pungent taste; *resin, gum, malic, and citric acids, albumen*, and salts of potassium, calcium, and ammonium. The products of combustion of tobacco are very numerous, including the volatile bases pyridin (C_5H_5N), picolin (C_5H_7O), collodin ($C_8H_{11}N$), and others of the same series, besides ammonia and various acids, such as acetic, butyric, valerianic, carbolic, formic, and probably others. Nicotina is said to be absent from the smoke, but this is probably true only when the combustion is very complete. The chemistry of tobacco requires further study.

Preparations.—A tincture, $\frac{N}{5}$, with alcohol, as in Sec. 48, Part I. The pure alkaloid, Nicotina, as described.

Uses.—The study of the numerous experiments on the medicinal and poisonous action of tobacco indicates much difference of opinion among observers as to its true nature and range of usefulness. Its influence seems to be directly upon the cerebellum, medulla oblongata, and medulla spinalis, but is also exerted through the ganglionic centres. In small doses it is stimulant to all these sources of innervation, and large doses may, when the centres are in hyperæmic condition, induce tonic and clonic convulsions, quickening of respiration and heart's action, and symptoms of exaggerated reflex functional activity. These stimulant effects are but transient, and are promptly followed by a sense of debility, with paleness, muscular relaxation, coldness of hands, feet, and finally of trunk, faintness, and even unconsciousness, vomiting, copious urination, oppressed breathing, muscular tremor or spasm, and finally paralysis of respiration with asphyxia, or of the heart with collapse and death. It has been extensively employed to produce relaxation of muscular spasm in strangulated hernia, tetanus, and strychnia poisoning; in the former by enema or fomentation, and with the other two by internal administration of infusion, or hypodermic injection of nicotia. The treatment is not without danger, and should be employed with caution, and only after other means seem futile. Spasmodic laryngitis and asthma have been treated by inhalation, or by swallowing tobacco smoke, but these, as well as several other similar uses, have been generally abandoned for better and safer remedies. The same is true of its local use in scabies, urticaria, gout, rheumatism, etc.

It is used internally in minute doses by homœopathic practitioners in conditions similar to those described as caused by poisonous doses.

Dose.—In strychnia poisoning or in tetanus use by enema, an infusion representing 15 grains = gm. 1.00 of the drug, repeating as convulsions appear; or, *R. Nicotiæ*, gr. ss., aquæ destill., ʒij. Mix. Sig. 10 drops subcutaneously, repeated as indicated. In hernia, use the enema as given above, and apply same, locally, on cloths.

TAMARINDUS. Tamarind.

The preserved fruit of *Tamarindus indica* (*T. officinalis*, *Hooker*).
Leguminosæ, *Cæsalpinea*. Linné. Bentley and Trimen.

Constituents.—*Tartaric*, *citric*, and *malic* acids in combination with potassium; *sugar*, *pectin*, and *mucilage*.

Uses.—Chiefly used as an excipient for medicines, or in solution made by dissolving in hot water or milk (one ounce to each pint), straining and allowing to cool, as a grateful cooling drink in fevers, to quench thirst, allay nausea, and to promote healing in aphthous sore mouth.

TANACETUM VULGARE. Tansy.

The fresh leaves and tops.

Compositæ, *Senecionidæ*.

Linné. Gray.

Constituents.—A *volatile oil*, *Oleum Tanaceti*, green or yellow in color, specific gravity 0.92 to 0.95, of bitter, pungent taste, camphor-like odor, and soluble in alcohol; a bitter principle, *tanacetin*, soluble in ether and alcohol, and slightly in water, *resin*, *malic acid*, *tannin*, *fixed oil*, *mucilage*, *albumen*, and *sugar*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

The volatile oil from the plant by distillation with water.

A tincture, $\frac{N}{10}$, of the oil with alcohol, as in Sec. 46, Part I.

Uses.—Tansy is a vascular excitant, causing an increase in the frequency of the pulse, flushing of the face, sensation of heat in the stomach and abdomen, congestion of the pelvic viscera with diuresis, and increased activity of the menstrual function. It resembles savine in its action, and may be employed in similar circumstances in which that drug is used, as a stimulant to the female organs of reproduction. Its tonic and stimulant virtues may be utilized in states of gastrointestinal atony, and locally, by spray or atomizer, in catarrhal and inflammatory states of the throat.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

Oil, gtt. j. to iv. = gm. 0.06 to 0.26, or equivalent.

TARAXACUM. Dandelion.

The fresh root, gathered in autumn, of *Taraxacum Dens-leonis*, *Desfontaines* (*Leontodon taraxacum*, Linné).

Compositæ, *Cichoreæ*.

Bentley and Trimen.

Constituents.—A bitter principle, *taraxacin*, amorphous, soluble in water and alcohol; *taraxacerin* ($C_8H_{16}O$), crystalline, soluble in alcohol, insoluble in water; *resin*, *inulin*, *levulin*, and *sugar*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—A feeble remedy, but will be found a useful one when a mild stimulant to the gastro-intestinal tract is needed. It promotes appetite, increases the power to digest food, and the elimination of waste matters, by kidneys and intestinal canal. The drug after drying, especially if old, is worthless.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to 3j. = gm. 0.66 to 4.00, or equivalent.

TAXUS BACCATA. Yew Tree.

The fresh branches with leaves and berries.

Coniferæ.

Linné. Bentley and Trimen.

Constituents.—*Volatile oil*; *taxina*, an amorphous, bitter principle, soluble in alcohol, ether, and acids, slightly soluble in water; *resin*, *tannin*, *gallic acid*, *sugar*, *mucilage*, and *malate of lime* are said to be present in the leaves. *Sugar*, *gum*, *malic*, and *phosphoric acids*, and red coloring matter in the fruit. *Volatile* and *fixed oil*, *bitter resin*, *taxina*, albumen, and *sugar* in the seeds.

Preparations.—A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—*Taxus* is a poisonous drug, whose medicinal applications have not been fully investigated. When taken in poisonous doses the symptoms are vomiting, purging, difficult urination, giddiness, coldness of the surface, irregularity of the heart's action, dilatation of the pupil, convulsions or great prostration. When the dose is very large there are no convulsions or gastro-intestinal irritation, the heart's action becoming feeble and irregular, and death resulting from syncope or coma. Its use has been suggested under the same indications, and for similar purposes as *digitalis*. It requires further careful study.

Dose.—Tincture, $\frac{N}{2}$, gtt. v. to x. = gm. 0.33 to 0.66, to water 3iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

TEPHROSIA VIRGINIANA. Hoary Pea.

The fresh herb in flower (*Galega virg.*, *Linné*).

The fresh root.

Leguminosæ, Papilionaceæ. Pers. Mehan, Native Flowers.

Constituents.—The plant has not been analyzed.

Preparations.—From both herb and root:

A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—These are by no means clearly defined. The taste is slightly acrid and somewhat bitter. It has been employed as a vermifuge, as a laxative, and as a stimulant to the nervous system in typhoid states. It requires investigation to determine its true medicinal value, if any. The tinctures are suggested for experiment.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

TEREBINTHINA CANADENSIS. Balsam of Fir.

The transparent, faintly greenish-yellow, viscid liquid oleoresin obtained from *Abies* (*Pinus*, *Linné*) *balsamica*.

Coniferæ. Miller. Bentley and Trimen.

Constituents.—Canada turpentine, like the other similar oleo-resinous exudations of the *coniferæ*, consists of a *volatile oil* ($C_{10}H_{16}$), holding in solution *resin* analogous to, though probably not identical with, common rosin. It becomes viscid and darker in color on exposure, but does not become opaque. Soluble in ether, chloroform, benzol, and in warm amylc alcohol.

Uses.—Chiefly used for chronic catarrhal conditions of the pulmonary and genito-urinary surfaces, as chronic bronchitis, chronic cystitis, gonorrhœa, etc. Its action may be considered identical with *Ol. terebinthina* (see *T. Communis*), and it may be similarly employed, though not so convenient on account of its viscosity. Some forms of chronic rheumatism, notably sciatica and lumbago, are often promptly relieved by it, though like oil of turpentine, which is similarly used, it sometimes fails.

Dose.—Grs v. to xv. = gm. 0.33 to 1.00, in pill or emulsion.

TEREBINTHINA CHIA. Chian Turpentine.

The oleo-resinous exudation obtained by incision made into the bark of *Pistacia terebinthus*. *Linné*.

Anacardiaceæ.

Bentley and Trimen.

Constituents.—*Volatile oil* combined with a *resin*, neither of which has been thoroughly studied.

Genuine chian turpentine is very scarce, the article sold for it being almost universally adulterated with Canada balsam, Venice and other turpentines. The genuine drug is said to be a greenish-yellow, tenacious, slightly opaque oleoresin, which is nearly solid, or becomes so by age, of mild taste, without marked bitterness, and of an odor variously described as suggesting fennel, citron, jessamine, or clemi. According to some writers, it is completely soluble in alcohol, ether, glacial acetic acid, benzol, or acetone; others state that while freely soluble in ether, alcohol only partially dissolves it.

Uses.—The use of this turpentine has been recently revived as a remedy often effective, for the cure of epithelial cancer, scirrhus of the breast, and the ulceration following previous operation for cancer. It is given internally in pills containing 3 grains of the turpentine with 2 grains of sulphur, or in emulsion made with ℥ss. of ethereal solution (℥j. to ℥ij.), mucilage of gum-arabic and syrup sufficient to make a pint. Sulphur (40 grains) is sometimes added to this mixture. It is advised that the drug be continued eight weeks to three months. The uncertainty of the purity of the drug, and the fact that the enthusiastic recommendations heretofore made, have not been confirmed, renders it quite probable that it will soon be classed with cundurango and similar drugs, which have only proven a temporary “hope for the hopeless.”

TEREBINTHINA COMMUNIS. Common Turpentine.

The concrete oleo-resinous exudation, obtained from *Pinus palustris*, *P. australis*, and other species of *pinus*.

Coniferæ.

Michaux. Bentley and Trimén.

Constituents.—The volatile oil, *Oleum Terebinthinæ*, which, when pure, has the composition $C_{10}H_{16}$, is colorless, of mild odor, but becomes pungent and of yellowish color with age and exposure to air. Its taste is peculiar, specific gravity 0.86 to 0.87, soluble in alcohol (10 to 12 parts, of specific gravity 0.835), benzol, chloroform, and ether; insoluble in water, and reacts violently with bromine and iodine.

The residue, after separation of the volatile oil by distillation, is common resin (see *Resina*). Common turpentine is a yellowish, viscid liquid when fresh, but becomes opaque and more or less solid by age and exposure.

Preparations.—The volatile oil as above described.

Uses.—The usefulness of this drug depends chiefly upon its volatile

oil, which is rapidly absorbed, and, when not in excessive amount, stimulates the nervous system, increases arterial tension, quickens the action of the heart, and causes slight symptoms of intoxication similar to those from alcohol. Teaspoonful doses cause an exaggeration of the symptoms given, with heat at the stomach, giddiness, and mental confusion. Excessive doses induce nausea, vomiting, purging, delirium, tenesmus, strangury, vaso-motor and other paralytic symptoms. Medicinally employed, it increases the functional activity of the kidneys and pelvic viscera, and is excreted by the mucous membranes of the lungs, genito-urinary and intestinal tracts, stimulating their surfaces at the point of escape. Its powerful stimulant influence on the vaso-motor system makes it one of the most useful of remedies in hemorrhages, especially of the passive variety, when the heart's action is weak and there is vascular relaxation, impoverishment of the blood, and muscular debility.

Hemorrhagic transudations of the renal, bronchial, intestinal, and nasal mucous membranes, due to vascular depression, come under its curative influence, and it is often successful in controlling hemorrhages from traumatic surfaces. Catarrhal states of mucous surfaces, when chronic or after subsidence of acute symptoms, which states usually depend upon impaired tonicity of the vessels, are benefited by its judicious employment. It may be thus used in chronic intestinal catarrhs, catarrh of the bladder and urinary passages, chronic bronchitis, with profuse expectoration, chronic gonorrhœa, gleet, etc.

Tympanitic distention of the bowels, dependent on intestinal atony, is often promptly relieved by its internal and local use.

Oil of turpentine is destructive of vibrio, bacteria, etc., and arrests fermentation and putrefaction. It is an efficient application to traumatic erysipelas, offensive atonic ulcers, and to gangrenous parts, arresting sloughing, and removing fetor. These uses of oil of turpentine, with others of minor importance, indicate that the remedy is beneficial chiefly when the symptoms indicate depression of the sympathetic ganglia, the condition being characterized by cardiac weakness, rapid pulse, which lacks resistance, tongue dry, with flakes peeling off leaving a glazed surface, tympanitis, vitiation of fluids with effete matters, offensive secretions, vaso-motor paresis, with catarrhal, hemorrhagic, and ulcerative tendency of mucous surfaces, languor of peripheral circulation, muscular relaxation and insensibility, or tendency thereto with incoherence of ideas.

Dose.—Oil turpentine, gtt. j. to 3ss. = gm. 0.06 to 2.00, in capsule, emulsion, or on sugar.

Crude turpentine is less efficient than its oil, and is therefore rarely used except as a constituent of plasters.

TESTA. Oyster-Shell.

The shell of *Ostrea edulis*. *Linné*.

Class, Acephala (conchifera), *Ord.* Lamillibranchia, *Fam.* Ostracea.

Constituents.—*Carbonate of calcium*, varying in amount in the different layers (88 to 98 per cent.), *organic matters* (0.5 to 4.5 per cent.), *calcium phosphate* and *sulphate*, *silica*, *magnesia*, *iron*, and *alumina*.

Preparations.—A powder, *Testa præparata*, as follows:

From a convenient quantity of oyster-shell, well washed with boiling water, remove the external colored layer by scraping with a knife. Powder the white inner layers in a mortar, and separate the coarse from the fine particles by elutriation with pure water; lastly, dry and reduce to an impalpable powder.

Uses.—Although chiefly composed of calcium carbonate, this preparation is more acceptable to the stomach than prepared chalk. The other constituents of testa, without doubt, make it more adapted to disorders of assimilation than carbonate obtained from an inorganic source. (See *Calcium Carbonate* and *Phosphate*.)

TEUCRIUM CANADENSE. Woodsage.

The fresh plant.

Labiatae, *Ajugoideæ*.

Linné.

Constituents.—*Volatile oil*, *tannin*, and a *bitter principle* appear to be present, though no analysis has been made.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—An allied European species, *T. marium* or *Germander*, has been employed considerably as a stimulant and tonic in menstrual disorders, chronic catarrhal conditions, etc. The American plant is suggested as a substitute, and for study to determine its real usefulness.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

THALICTRUM ANEMONOIDES. Rue Anemone.

The fresh plant with tuberous roots.

Ranunculaceæ, *Anemoneæ*.

Michaux. *Gray*.

Constituents.—Not known, as no analysis has been made.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—This drug has received but little study. It has been recommended as a remedy for internal and external hemorrhoids unaccompanied by hemorrhage. Two or three of the small tubers are directed to be eaten three times per day. The tinctures are suggested for further study.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

THAPSIA GARGANICA. Thapsia.

The root.

Umbelliferæ, Orthospermæ.

Linné.

Constituents.—The fresh plant yields, when cut, a milky juice. The dried root yields to alcohol an acrid *resin*, soluble also in ether and bisulphide of carbon; associated with the resin is a small amount of a volatile acrid principle. The resin seems to be analogous to that of euphorbium.

Preparations.—A resin, with alcohol, as in Sec. 27, Part I.

A tincture, $\frac{N}{10}$, of the resin, with alcohol, as in Sec. 46, Part I.

Uses.—This drug, native to North Africa and Southern Europe, is rarely used in this country. Locally, applied in plaster containing the resin (6.5 per cent.), or by coating adhesive plaster with the tincture, it is employed in France as a stimulant and counter-irritant for the relief of local rheumatic and neuralgic pain. When its application is prolonged, it causes a vesicular eruption, which may become confluent with ulceration, and, on healing, leaves a scarred surface like that from small-pox.

It is not used internally.

THEA. Tea.

The leaves of *Camelia thea*, *Link.*

Ternstroemiaceæ.

Bentley and Trimen.

Constituents.—*Theina*, which is said to be chemically and physiologically identical with caffeine (see *Caffea*); *tannin*; a small amount of *gallic acid*; a variable amount of *volatile oil*, which concretes at ordinary temperatures, is of a yellow color and aromatic odor and taste; *resin*; *pectin*; *albumen*; *wax*, and *chlorophylle*.

Uses.—Notwithstanding the identity of the alkaloid principles of tea and coffee, the effects of the infusions of these substances are by no

means exactly alike. Infusions of tea stimulate the nervous system and relieve muscular fatigue and soreness due to great physical exertion. When used very strong it causes nervous agitation, muscular impairment and tremor, with gastralgia and other neuralgic disorders. Both tea and coffee induce wakefulness, but the result with the former is due to nervous tension, and not to exhilaration due to increased vascular activity, as is the case with the latter, which more nearly resembles alcohol or small amounts of opium in its stimulant effects. These differences in action between tea and coffee, in view of the identity of their alkaloids, must be attributed to other constituents, perhaps volatile oil.

The tannin of tea, together with its value as a nerve stimulant, makes it a useful agent in strong infusion, as an antidote to opium-narcosis, etc. It is also locally employed in catarrhal disorders of the genito-urinary tract, conjunctiva, and throat.

THEOBROMA CACAO. Cacao.

The seeds.

Sterculiaceæ.

Linné. Bentley and Trimen.

Constituents.—A yellowish-white solid fat, Oleum Theobromæ, which may be broken when cool, fuses by contact with the body, melts at 86° to 91.4° F., of specific gravity 0.90, and soluble in ether, acetic ether, and hot, strong alcohol, separating almost entirely from the latter when cool; an alkaloid, *theobromina* ($C_7H_8N_4O_2$), closely analogous to caffeine (methyltheobromina), into which it may be converted; a somewhat *volatile, odorous principle*, of undetermined nature; *starch*; *sugar*; *proteids*, and inorganic matters.

Preparations.—Ol. Theobromæ, or cacao butter, prepared by pressing the kernels of the seeds between heated iron plates.

Uses.—Experiment has proven that, upon animals, the actions of caffeine, theina, and theobromina is identical in kind, though the latter is poisonous and fatal in much smaller doses. It has not been employed therapeutically. The kernels of the cacao seeds, ground to a paste, incorporated with their own weight of sugar, and flavored, constitute chocolate of commerce, whose dietetic uses are well known. Chocolate, prepared with milk, is a grateful, nutritive drink, useful during convalescence or in place of the more exciting liquids, tea and coffee.

Ol. Theobromæ, though occasionally used as an emollient dressing for irritable surfaces and wounds, is chiefly employed as a basis for suppositories, for which its nature makes it well adapted.

THUJA OCCIDENTALIS. Arbor Vitæ.

The fresh leaves collected at the beginning of flowering.

Coniferæ.

Linné.

Constituents.—A *volatile oil*, colorless or greenish, specific gravity 0.925, and soluble in alcohol; a bitter principle, *pinipicrin* ($C_{22}H_{18}O_{11}$), soluble in alcohol and water; a glucoside, *thugin* ($C_{20}H_{22}O_{12}$), which crystallizes in yellow tubular crystals, of astringent taste, soluble in alcohol and water; two *resins*; *tannin*; a *gelatinous body*, and *sugar*.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—When from direct or reflex irritation there is an abnormal production of epidermic and epithelial cells, and an accumulation thereof in particular parts, swellings of mucous surfaces, indurations, callosities, and tumors of the skin arise, which are composed of such cells, more or less compressed together, united by fibrous filaments, and supplied with blood-vessels. Such growths, which are usually classed as epithelioma, include warts, condylomata, callosities, scaly skin-diseases, etc. Thuja, used internally and locally, limits the cell-proliferation and gradually removes the growth, or abnormality, dependent thereon. This influence is probably due to its power of reducing the calibre of the vessels supplying the part and thus limiting its blood supply. Affections of the bronchia, bladder, urethra, or other mucous surfaces, when their secretions are morbid, as indicated by unusual numbers of softened epithelial cells, are benefited by it internally and (when possible) locally used.

It is an effectual remedy locally applied to vascular bulging nævi, and has also proven effective as an injection into the tunica vaginalis testis for the cure of hydrocele.

Dose.—Tincture, $\frac{N}{I}$, gtt. v. to xxx. = gm. 0.33 to 2.00, or equivalent. Locally, the tincture, $\frac{N}{2}$, may be used full strength.

THYMUS VULGARIS. Garden Thyme.

The fresh herb in flower.

Labiata, Saturiæ.

Linné. Bentley and Trimen.

Constituents.—The important constituent is the volatile oil, *Oleum Thymi*, which is of a reddish-brown color when crude, and colorless when rectified. The crude oil is commonly sold as oil of organum. The pure rectified oil is colorless or yellow, of specific gravity 0.88 to 0.90, and consists of two hydrocarbons, *cymene* ($C_{10}H_{14}$), and *thymene*

($C_{10}H_{16}$), which hold in solution a stearopten, thymol ($C_{10}H_{14}O$). *Thymol* is separated from the oil by fractional distillation, and after purification crystallizes in thin scales without color, of aromatic odor, burning taste, specific gravity 1.028, freely soluble in alcohol, chloroform, benzol, ether, warm fats and oils, and carbon bisulphide, but slightly soluble in water.

Preparations.—A tincture, $\frac{N}{2}$, from the herb, with alcohol, as in Sec. 45, Part I.

A tincture, $\frac{N}{10}$, from the oil, with alcohol, as in Sec. 46, Part I.

The oil distilled from the flowering herb.

The proximate principle, Thymol.

A solution, $\frac{N}{1000}$, of Thymol, as follows:

Take of Thymol, <i>one part</i>	. . . . .	1
Alcohol, <i>ten parts</i>	. . . . .	10
Glycerine, <i>twenty parts</i>	. . . . .	20
Water sufficient to make <i>one thousand parts</i>	. . . . .	1000

Dissolve the thymol in the alcohol, and mix with the glycerine and water.

An ointment, $\frac{N}{2}$, of thymol, as follows:

Take of Thymol, <i>one part</i>	. . . . .	1
Ungt. paraffini, <i>nine parts</i>	. . . . .	9

Rub the thymol into solution, with equal weight of alcohol, and mix by trituration with the paraffine ointment.

Uses.—Thymol arrests and prevents saccharine and butyric, and retards the lactic fermentation; it prevents septicemia, destroys foul odors from decomposition of tissue or fluids, also the vitality of septic germs, organized and living ferments, and prevents decay of animal substances. It is in no wise inferior to carbolic acid in these respects, and its odor is much more pleasant. The solution is convenient to remove odors from the hands in obstetric or surgical practice, and as a lotion to correct fetor of suppurating wounds and burns, as a spray in diphtheria, and to use for antiseptic dressing, instead of carbolic acid, during important surgical operations. The ointment is useful in psoriasis and other skin diseases, when a stimulant antiseptic is needed. The use of *Thymus Vulg.*, *Tinct.* $\frac{N}{2}$, or equivalent, is suggested, in small doses, for disorders of the gastro-intestinal canal and genito-urinary surfaces, caused or aggravated by the presence of fermenting or decomposing secretions.

Dose.—*Thymus vulg.*, *Tinct.* $\frac{N}{2}$, gtt. v. to x. = gm. 0.33 to 0.66, to water \mathfrak{z} iv., mix. Teaspoonful doses (gm. 4.00).

Ol. Thymi as an addition to stimulating liniments, or as a substitute for thymol for preparing antiseptic solutions. One part of oil equals one-third of a part of thymol.

Thymol *Liq.*, $\frac{N}{1000}$, for local use by spray, wash, or injection; diluted when surfaces are highly irritable. The same may be given internally in doses of gtt. j. to iij. = gm. 0.06 to 0.20.

TILIA AMERICANA. Linden Tree.

The flowers.

Tiliaceæ.

Linné. Gray. Willdenow.

Constituents.—A minute amount of *volatile oil*, *tannin*, *sugar*, *pectin*, *mucilage*, *fat*, *malates*, and other salts.

Uses.—Linden flowers do not possess any marked potency as a remedy, but the agreeable odor and taste of their infusion renders it a pleasant vehicle for active medicines. The European linden flowers are thus employed, and also for headache, vertigo, recent colds, and diarrhœa. The American varieties have equal value. The bark and twigs are occasionally employed like *ulmus fulva*, for poultices.

TORMENTILLA. Tormentil.

The rhizome of *Potentilla tormentilla* (T. erecta, Linné).

Rosaceæ, *Rosææ.*

Sibthorp. Bentley and Trimen.

Constituents.—*Tormentil-tannic acid* ($C_{26}H_{22}O_{11}$); *kinovic acid* ($C_{24}H_{38}O_4$); *tormentil red*, probably identical with rhatany red; a small amount of *ellagic acid*, *resin*, *mucilage*, *wax*, and oxalate of calcium.

Uses.—A pure astringent, which may be used like tannin, and in similar conditions.

Dose.—Of the powdered drug, grs. v. to xv. = gm. 0.33 to 1.00, or equivalent in decoction or infusion.

TRAGACANTHA. Tragacanth.

The gummy exudation from *Astragalus verus* and other species of *Astragalus*.

Leguminosæ, *Papilionaceæ.*

Bentley and Trimen.

Constituents.—A *soluble gum* (8 to 10 per cent.) analogous to arabin; an insoluble gum commonly called *bassorin* ($C_{12}H_{20}O_{10}$), but recently claimed to be identical with pectose (60 per cent.); *starch* (2 to 3 per cent.); *cellulose* (3 per cent.); *mineral matters* (3 per cent.), and a trace of *nitrogenous matter*. Tragacanth is without odor or taste; is insolu-

ble in alcohol or ether, but with about 50 parts of water forms a jelly-like mass. In a large amount of water, it forms a ropy liquid, which, on filtration, leaves an undissolved residue.

Uses.—Used like gum-arabic, as a demulcent and nutrient, but is less eligible on account of its insolubility. It is commonly associated with medicines of greater power, either as a vehicle or for its protective action on irritable surfaces.

TRIFOLIUM PRATENSE. Red Clover.

The fresh blossoms.

Leguminosæ.

Linné. Gray.

Constituents.—These have not been determined.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Chiefly employed in spasmodic coughs, as whooping-cough and the cough of measles. Irritable states of the larynx, bronchiæ, and pulmonary organs are often removed by its use, but the drug requires further study to determine the exact condition, when it will prove beneficial.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

TRIGLOCHIN MARITIMUM. Arrow Grass.

The fresh herb.

Alismaceæ, Juncaginææ.

Linné.

Constituents.—No analysis has been published.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Noticed and recommended as an active diuretic, of value in renal and cystic disorders. It is commonly used in infusion. The tinctures are suggested for trial.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent.

TRILLIUM ERECTUM. Bethroot.

The fresh rhizome.

Liliaceæ.

Linné.

Constituents.—*Resinous* and *fatty* matters; a *volatile principle* in minute amount; an *acrid principle*, soluble in alcohol, insoluble in water, with which it forms a foamy mixture like saponin; *tannin* and coloring matters. None of these have been carefully examined.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—A remedy for the control of hemorrhage, especially from the uterus (after confinement, abortion, or when due to relaxation), though it is efficient in all hemorrhages from the mucous surfaces. Catarrhal states of the mucous membranes of the air-passages, pulmonary or genito-urinary tracts, when due to vascular engorgement, also come within its curative scope. It seems to influence the muscular elements of the vessels, and of the tissue in which they are found, imparting tonicity, and thus controlling fluxes, mucous or hemorrhagic. Its local use is often beneficially conjoined with its internal employment.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

TRIMETHYLAMINÆ HYDROCHLORAS. Hydrochlorate of Trimethylamine.

The pure salt in white or colorless prismatic crystals, nearly inodorous, of pungent, saline taste, and very deliquescent on exposure.

It is obtained by neutralizing pure hydrochloric acid with the pure alkaloid, trimethylamina, $(CH_3)_3N$.

Solubility.—Freely soluble in alcohol and water.

Uses.—Trimethylamine is sometimes incorrectly called propylamin, with which it is isomeric.

Its usefulness is well established in cases of acute articular rheumatism, but, owing to the introduction of other efficient remedies, and, perhaps, to its offensive, herring-like odor, it has fallen into obscurity. The chloride of trimethylamine is free from unpleasant odor, has but a faint taste, and is said to be as effective as the free alkaloid. It deserves attention.

Dose.—Grs. ij. to iij. = gm. 0.13 to 0.20, every two or three hours. It may be dissolved in syrup, and flavored to taste.

TRIOSTEUM PERFOLIATUM. Fever Root.

The fresh root.

Caprifoliaceæ.

Linné.

Constituents.—Not determined. The taste is bitter and somewhat nauseating. Alcohol extracts its active constituents.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Not well defined. Irritable states of the gastro-intestinal

tract, such as are manifested in some forms of indigestion, sick headache, bilious headache, colic, diarrhœa, etc., are relieved by the drug in small doses. In large doses, it causes purging and diuresis.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent, to water \tilde{z} iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

TRITICUM REPENS. Couchgrass Root.

The rhizome.

Graminaceæ.

Linné.

Constituents.—A peculiar principle, gum-like in appearance, resembling inulin, and called *tritacin*; *fruit sugar*; *levulose*, and a sugar resembling but not identical with cane sugar.

Uses.—It does not appear that couchgrass possesses any very marked medicinal activity, although its decoction or infusion increases the renal secretion, and palliates irritation of the urinary surfaces. It is extensively employed in Europe for this purpose, and in decoction as a grateful drink, to relieve fever and allay thirst.

Dose.—In decoction, prepared by boiling \tilde{z} ij. to \tilde{z} iv. = gm. 64.00 to 128.00 in water Oij. = gm. 1000, until reduced one-half. Use *ad libitum*.

TURNERA APHRODISIACA. Damiana.

The leaves and top.

Turneraceæ.

Ward and Vasey. Va. Med. Monthly, 1876.

Constituents.—These have not been determined.

Other species of *Turnera* are sold in the market as damiana, notably *T. microphylla*, D. C. The leaves of the *Aplopappus discoidens*, D. C. (*Compositæ*, *Asteroidæ*), are often sold as “damiana,” though having none of the sensible properties of the species *Turnera*.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, 3 parts, water, 2 parts, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, 3 parts, water, 2 parts, as in Sec. 43, Part I.

Uses.—This drug has been given wide notoriety for its supposed value in the treatment of sexual impotency. There is reason to believe that its efficiency, if any, may be attributed with as much accuracy to “expectant attention” on the part of the patient as to the drug. It is tonic and somewhat laxative, but its real utility, if any, is yet to be determined.

Dose.—Tincture, $\frac{N}{1}$, gtt. xv. to \tilde{z} j. = gm. 1.00 to 4.00, or equivalent.

TUSSILAGO FARFARA. Coltsfoot.

The fresh herb.

Compositæ, Eupatoriææ.

Linné.

Constituents.—A *bitter principle*, whose real nature is undetermined, *tannin*, and *mucilage*.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—A feeble remedy, but occasionally useful in obstinate chronic coughs to allay bronchial irritation. An alterative influence in scrofulous affections has been ascribed to the fresh juice, but upon what evidence does not appear.

Dose.—Tincture, $\frac{N}{1}$, gtt. xv. to 3ss. = gm. 1.00 to 2.00, or equivalent.

ULMUS FULVA. Slippery Elm.

The inner bark.

Urticacæ, Ulmææ.

Michaux. Bentley and Trimen.

Constituents.—*Mucilage*, soluble in water, and separated from this solution as a gelatinous liquid by adding alcohol. The powdered and ground bark of commerce is commonly adulterated with starch or flour. It may be detected by the blue color produced by adding a drop of tincture of iodine to a mixture of the suspected powder and boiling water. Starch is not present in the pure bark.

Uses.—A mucilage prepared by macerating the sliced bark in boiling water for two hours and straining, forms a grateful drink in irritable states of the pulmonary, gastro-intestinal, and urinary tracts. The ground and powdered bark is an excellent basis for cataplasms. Great care should be taken to prevent drying upon the integument, and thus becoming a source of irritation.

URTICA DIOICA. Nettle.

The fresh plant.

Urticacæ, Urticææ.

Linné.

Constituents.—*Tannic acid* has been announced as present in the stinging hairs of this plant, but they probably have also another irritating constituent. *Mucilage*, *salts*, and the ordinary constituents of plants are present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Used by homœopathic practitioners for the treatment of urticaria when the skin is elevated, having white central spots and areolæ, attended by stinging and burning. Strangury, gravel, hæmaturia, menorrhagia, hæmoptysis, diarrhœa, and dysentery, present pathological states in which this drug may be usefully employed. In irritable states of skin, mucous surfaces, and with hemorrhage from active determination of blood, the dose should be minute. In torpid states and hemorrhages of a passive character, the dose may be considerably increased.

Dose.—Tincture, $\frac{N}{1}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

USTILAGO MAYDIS. Corn Smut.

The freshly gathered fungus from the mature corn (*Zea Mays*, *Linné*) before it is cut.

Fungi, Coniomycetes (Nees).

Leveillé.

Constituents.—*Fusel oil* (4.2 per cent.) ; a *volatile alkaline substance* in small amount, not identified ; an *albuminous substance* (5.5 per cent.), resembling sclerotic acid of ergot ; a *substance soluble in alcohol* and of acid reaction, but not fully examined ; sugar corresponding to 12.87 per cent. of starch, but which is probably produced by the decomposition of the smut itself. Another examination gives as present *secalin* combined with an acid, a *thick oil*, *resin*, soluble in ether, *pectin*, *gluten*, and sugar. The drug requires further chemical study.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

A trituration, $\frac{N}{100}$, as in Sec. 49, Part I.

Uses.—Frequently spoken of and recommended as a substitute for ergot, but though it resembles that agent, its action is not as potent. Its influence upon the uterus is unquestionable, and it is a useful remedy in atony of its tissues characterized by menorrhagia, the blood being dark and forming stringy clots, copious leucorrhœa during intermenstrual periods, cervical and uterine enlargement ; also in uterine atony following labor ; subinvolution of the uterus, and the reflex motor or sensory disturbances accompanying these states. Active hemorrhage or uterine congestion are better met by other remedies, but ustilago may prove useful in minute doses. The skin is influenced by this drug, but further study is required to determine its real utility in that direction.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent, to water \mathfrak{z} iv. = gm. 128.00. Teaspoonful doses (gm. 4.00).

UVA URSI. Uva Ursi.

The recent leaves of *Arctostaphylos uva ursi*.

Ericaceæ, Ericinææ.

Sprengel. Bentley and Trimen.

Constituents.—*Arbutin* ($C_{24}H_{32}O_{14}, H_2O$), a glucoside which forms colorless, silky crystals, of a bitter taste, neutral reaction, and soluble in alcohol and hot water; *ericolin* ($C_{34}H_{56}O_{21}$), a bitter glucoside of brownish-yellow color, soluble in alcohol and water; *ursone* ($C_{20}H_{34}O_2$), in tasteless, silky needles, fusible, sublimable, sparingly soluble in cold alcohol and ether, insoluble in water, dilute acids, and alkalies; *tannin*, *gallic acid*, *resin*, *sugar*, and some unimportant non-medicinal bodies.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, *six parts*, water, *five parts*, glycerine, *three parts*, as in Sec. 40, Part I.

A decoction, $\frac{N}{10}$, as in Sec. 18, Part I.

Uses.—Useful in irritable states of the renal, cystic, and urethral surfaces, such as are present in dysury, strangury, cystitis, and incontinence, whether the condition be due to the presence of calculi or other causes. Catarrhal states of the genito-urinary tract, as of the bladder, leucorrhœa, gonorrhœa, or of other mucous surfaces, as bronchitis, intestinal catarrh, etc., are benefited and often cured by its persistent use. Acute stages require minute doses, chronic and relaxed conditions somewhat larger ones. An influence upon the uterus similar to that of ergot is claimed for this drug, and has caused its employment in hemorrhages, etc.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, in warm water. Decoction, $\frac{N}{10}$, in equivalent doses.

VALERIANA OFFICINALIS. Valerian.

The root.

Valerianaceæ.

Linné. Bentley and Trimen.

Constituents.—A volatile oil, *Oleum Valerianæ*, of greenish-yellow color, limpid, mild odor when fresh, strong, peculiar odor when old, or from old root, specific gravity 0.94, aromatic taste, soluble in alcohol and ether; composition not settled, but probably a mixture of a carbohydrogen, borneene ($C_{10}H_{16}$), a product of its hydration, the alcohol borneol ($C_{10}H_{18}O$), its ether [$(C_{10}H_{17})_2O$], the formic and acetic ethereal compounds with borneol, and the valerianic ether of borneol ($C_{10}H_{17}, C_5H_9O_2$), the latter yielding valerianic acid by decomposition, which explains its presence in old oil. In addition to the oil, the root

contains *resin, tannin, malic, acetic, and formic acids, starch, and mucilage.*

Preparations.—The volatile oil prepared by distillation with water.

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 44, Part I.

[Tinctura Valerianæ, U. S. P. = $\frac{N}{5}$.]

Uses.—An efficient remedy for the control of the exaggerated motor and sensory phenomena induced by morbid reflex excitability, and characterized by nervous palpitation of the heart, dyspnœa or cough, hysterical dyspepsia, flatulence, globus, temporal or frontal headache, coldness of extremities, feeble pulse, restlessness, sleeplessness, polyuria, etc. These symptoms are found in hysteria, hypochondriasis, typhoid states, neurasthenia, etc.

Dose.—Tincture, $\frac{N}{1}$, gtt. xv. to 3j. = gm. 1.00 to 4.00, or equivalent. Oil, gtt. j. to v. = gm. 0.06 to 0.33, in pill or emulsion.

VANILLA PLANIFOLIA. Vanilla.

The prepared, unripe fruit.

Orchidacæ.

Andrews. Bentley and Trimen.

Constituents.—*Vanillin* ($C_8H_8O_3$), an odorous body of slight acid reaction, crystallizing in colorless, four-sided prisms, of pungent, warm taste, freely soluble in alcohol, ether, fats, volatile oils, and boiling water; soft *resin*; *fixed oil*; *sugar*, and *gum*. Vanillin has been prepared artificially by the oxidation of the glucoside coniferin ($C_{16}H_{22}O_8$), and also from carbolic acid.

Preparations.—A tincture, $\frac{N}{10}$, as follows:

Take of Vanilla, finely cut, <i>one part</i>	.	.	.	.	.	.	1
Sugar, <i>two parts</i>	.	.	.	.	.	.	2
Alcohol, }	in the proportion of { <i>seven parts</i>						7
Water, }							3
To make <i>ten parts</i>	.	.	.	.	.	.	10

Beat the vanilla with the sugar until a uniform powder is obtained. Treat this powder with the mixture of alcohol and water, as directed in Sec. 47, Part I.

A trituration, $\frac{N}{10}$, as in Sec. 49, Part I.

[Tincturæ vanillæ, U. S. P. = $\frac{N}{10}$.]

Uses.—As a flavor for disagreeable drugs or mixtures, and for pastry, jelly, ice cream, etc.

VERATRIA, $C_{32}H_{52}N_2O_8$. M. wt. 592. **Veratria.**

The alkaloid from *Veratrum sabadilla* (see *Sabadilla*), as a whitish, amorphous powder, with an acrid taste, and powerfully sternutatory.

Solubility.—Soluble in alcohol (3 parts), glycerine (96 parts), ether (6 parts), chloroform (8.6 parts), olive oil (56 parts), and slightly in water (1000 parts).

Tests.—*Fixed impurities*; residue when ignited on platinum foil. It should dissolve in concentrated pure sulphuric acid, with a red color, which gradually fades; in nitric acid, with a yellow color; in hydrochloric acid, when heated, with a red color. These tests, with the solubility as given, establish the purity of veratria.

Preparations.—An ointment, $\frac{N}{25}$, as follows:

Take of Veratria, <i>four parts</i>	4
Adeps benzoïnatus, <i>ninety-six parts</i>	96
Alcohol, <i>a sufficient quantity</i>	q. s.

Dissolve the veratria in a small quantity of alcohol by rubbing together in a warm mortar; then add the lard gradually, and mix thoroughly together.

[Ungt. Veratrinæ, U. S. P. = $\frac{N}{25}$.]

A glycerite, $\frac{N}{100}$, as follows:

Take of Veratria, <i>one part</i>	1
Glycerine, <i>ninety-nine parts</i>	99
Alcohol, <i>a sufficient quantity</i>	q. s.

Dissolve the veratria in a small quantity of alcohol, by rubbing in a warm mortar, then gradually add the glycerine; mix well together, and keep warm until the alcohol has evaporated.

Uses.—Internally, in doses of gr. $\frac{1}{3}$ = gm. 0.005, for acute articular rheumatism. The dose is gradually increased in frequency until the sixth or seventh day, and then decreased, until finally abandoned. The development of toxical effects, such as nausea and slowing of pulse, should cause its immediate suspension. The results attained in this treatment are by no means uniformly satisfactory, and its internal employment, in this and other diseases, may be considered of questionable advisability in the present state of our knowledge. Further study with minute doses may develop important uses.

Locally, in ointment, it is used to allay pain in neuralgia of the fifth pair, sciatica, etc. It should be applied with the finger, guarded by a glove, along the course of the affected nerve, until a burning and prick-

ing sensation is felt by the patient. Abraded surfaces should be avoided.

VERATRUM ALBUM. White Hellebore.

The rhizome.

Melanthaceæ.

Linné.

Constituents.—An alkaloid, *veratralbia* ($C_{28}H_{43}NO_5$), white, bitter, acrid, sublimable in feathery crystals, soluble in alcohol, ether, chloroform, carbon bisulphide, and, with the formation of uncrystallizable salts, in dilute acids; *jervia* ($C_{26}H_{37}NO_3$), an alkaloid, soluble in alcohol and chloroform, insoluble in water and ether, tasteless, forming soluble salts with sulphuric and acetic acids, but their solutions are precipitated with sulphuric, hydrochloric, and nitric acids; *pseudojervia* ($C_{29}H_{43}NO_7$), an alkaloid, insoluble in ether, soluble in strong sulphuric acid, with a yellow color, and forming a sulphate soluble in water; *rubijervia* ($C_{26}H_{43}NO_2$), an alkaloid, soluble in ether, colored red by sulphuric acid, and forming a readily-soluble sulphate; *jervic acid* ($C_{14}H_{16}O_{12} \cdot 2H_2O$), of acid taste, white, crystalline, soluble but sparingly in absolute alcohol and ether, soluble in cold water (100 parts), insoluble in benzene, chloroform, and carbon bisulphide; *veratramarin*, a neutral, bitter principle of light-yellow color, soluble in alcohol and water, insoluble in chloroform, ether, and benzene; soft *resin*, soluble in alcohol, and probably inert when free from the acrid alkaloid *jervia*; *gum*, *starch*, and *pectin*. According to some observers, a small amount of *veratria* is also present, but this is doubtful.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—Internally employed in minute doses in disorders of the tissues to which the pneumogastric nerve distributes, and in intestinal diseases of a choleraic type. The conditions indicating it are characterized by coldness and blueness of the surface, sunken, pinched features, vomiting, abdominal cramping, coldness of tongue, cold sweat, thirst, watery diarrhœa, thready, almost imperceptible pulse, weak action of the heart, etc. Homœopathic physicians employ it in cholera, choleraic diarrhœa, spasmodic suffocative coughs, and whooping-cough.

Locally, it is used only in ointment, to destroy vermin and allay itching, but it is inferior to other remedies for the purpose.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to x. = gm. 0.33 to 0.66, or equivalent, to water ℥iv . = gm. 128.00. Teaspoonful doses (gm. 4.00).

VERATRUM VIRIDE. American Hellebore.

The fresh rhizome.

Melanthaceæ.

Aiton. Gray.

Constituents.—Two alkaloids, *jervia*, identical with that obtained from *V. album*, and *veratroidia*, which is white, amorphous, bitter, irritant, leaving tingling sensation on the fauces, soluble in alcohol, ether, chloroform, and carbon bisulphide, and forming soluble uncrySTALLIZABLE salts with acids. Other alkaloids have been announced as present, but the above statement embodies the prevailing conclusion. *Resin* in considerable amount and of acrid taste (probably due to adherent alkaloids), is also present.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

A saccharated extract, $\frac{N}{I}$, from the recently dried drug, with alcohol, as in Sec. 21, Part I.

[Tinctura Veratri Viridis, U. S. P. = $\frac{N}{2}$.]

Uses.—A drug which has been extensively used and abused. It exerts a decided influence over the cerebro-spinal nervous system, especially the cerebellum and cerebral portion of the cord, and also over the muscular system. Judiciously employed, it controls the heart's action to a remarkable degree, reducing its frequency and force, probably by inhibitory stimulation of the cardiac portion of the pneumogastric.

In excessive doses, or when too long continued, nausea, vomiting, and alarming prostration result. It is most useful as a remedy in the congestive stage of inflammation, and in sthenic conditions in fevers, when the pulse is full, bounding, and frequent. Small doses, repeated at short intervals, give the best results, reducing the frequency of the pulse within a few hours without the unpleasant prostration which results from its bolder employment in larger doses. In administering veratrum it is a good rule to decrease the dose, or its frequency, as soon as its action has reduced the pulse rate to that of health, unless, perhaps, in the case of dangerous wounds, as of the head, heart, pericardium or peritoneum, where a somewhat less frequent arterial movement than the normal might prove beneficial. Spasmodic and convulsive diseases, mania, metritis, dysmenorrhœa, puerperal fever, hysterical convulsions, especially when there is gastric irritation, and the pulse is of the character indicating great vascular excitement, the brain being congested, erysipelas, rheumatism, pneumonia, eruptive fevers in the invasive stage, remittent fevers, etc., frequently present the conditions for its employment. Diluted with water (3j. to Oj.),

it forms a useful local application in erysipelas, and the tincture, undiluted, will frequently arrest incipient local inflammation, as of abscess, boils, tonsillitis, etc. Apply with a camel's-hair brush.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent, to water \mathfrak{z} iv. = gm. 128.00. Teaspoonful doses every one-half to two hours.

VERBASCUM THAPSUS. Mullein.

The fresh herb beginning to flower.

Scrophulariaceæ.

Linné.

Constituents.—The flowers contain a minute amount of *volatile oil*; *yellow coloring matter*, soluble in alcohol, insoluble in water and ether; a *fatty body*, *sugar*, and *mucilage*. The latter is also present in the leaves.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Though a feeble agent, it is usefully employed in irritable and catarrhal conditions of the pulmonary, intestinal, and genito-urinary tracts. It exerts a soothing influence in irritable states of the nervous system, promotes sleep, and relieves cough, tormina, and ardor urinæ. Commonly employed in infusion, but the tinctures suggested will serve a good purpose. A concentrated decoction has been successfully employed per orem and by injection to destroy thread-worms.

Dose.—Tincture, $\frac{N}{1}$, gtt. v. to xv. = gm. 0.33 to 1.00, or equivalent.

VERBENA HASTATA. Blue Vervain.

The fresh plant in flower.

Verbenacææ.

Constituents.—Not known.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Not well defined. It has been employed successfully as a remedy in intermittents, given in strong decoction just as the paroxysm is coming on. It is usually pushed until emesis results. The decoction is also used in smaller amounts as a remedy for coughs, and locally applied as one of the many remedies for the poison of rhus tox. It is imperfectly studied, and the tinctures are suggested for trial.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to xxx. = gm. 0.66 to 2.00, or equivalent.

VERBESINA VIRGINICA. Crownbeard.

The fresh leaves and tops.

Compositæ, Senecionideæ.

Linné.

Constituents.—Not known.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—Gravelweed, one of the common names of this drug, indicates the direction of its employment. It has been recently recommended in strong decoction to allay irritation from "gravel," for vesical tenesmus, and as a diuretic. The tinctures are suggested for trial.

Dose.—Tincture, $\frac{N}{1}$, gtt. xv. to 3j. = gm. 1.00 to 4.00, or equivalent. The decoction ad libitum.

VERONICA OFFICINALIS. Speedwell.

The fresh plant in flower.

Scrophulariaceæ.

Linné.

Constituents.—No careful analysis has been made, though *tannin* and a *bitter principle* are known to be present.

Preparations.—A tincture, $\frac{N}{1}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This drug deserves careful study. It has proven curative to cutaneous eruptions and ulcers, and to catarrhal and ulcerative conditions of mucous surfaces. Bronchitis, stomatitis, vesical catarrh, calculous disorders, scrofulous eruptions and ulcers, scabies, and even leprosy, are enumerated as presenting the diseased conditions cured by it. It increases elimination by the kidneys, and has been successfully employed in abdominal dropsy. *V. beccabunga*, Linné, or brooklime of European growth, possesses similar properties, and may be prepared and used in a similar manner.

Dose.—Tincture, $\frac{N}{1}$, gtt. x. to 3j. = gm. 0.66 to 4.00, or equivalent.

The fresh herb in decoction, $\frac{N}{10}$ (Sec. 18, Part I.), locally and internally, in equivalent amounts to dose of tincture.

VIBURNUM OPULUS. High Cranberry.

The fresh bark of the root and shrub.

Caprifoliaceæ.

Linné.

Constituents.—*Viburnic acid*, said to be identical with valerianic acid, and *viburnin*, a neutral bitter principle, of light-yellow color,

soluble in alcohol and slightly so in water, are the constituents of medical interest.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—Cramp-bark, one of the common names of this drug, suggests the purpose for which it is most often employed. The muscular cramps of the abdomen and legs, so annoying in some cases of pregnancy, false pains preceding, and cramping after labor, the pains of threatened miscarriage, and those of spasmodic dysmenorrhœa, are often promptly cured by this remedy, which deserves more attention in such cases.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent.

VIBURNUM PRUNIFOLIUM. Black Haw.

The fresh bark of the tree.

Caprifoliaceæ.

Linné.

Constituents.—Not known. From sensible properties, probably analogous to *V. opulus*.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—A valuable remedy in irritable states of the uterus, ovaries, and, indeed, of the entire pelvic contents. Cramps, spasm, colic, and similar evidences of undue motor innervation are the indications for its use. It may be used with advantage in all cases in which the *V. opulus* is recommended, but especially is valuable to prevent abortion, for which it has been extensively employed.

Dose.—Tincture, $\frac{N}{I}$, gtt. xv. to 3j. = gm. 1.00 to 4.00, or equivalent. Repeat with frequency demanded by urgency of symptoms.

VINUM. Wine.

Pure wine prepared from the juice of grapes, the fruit of *Vitis vinifera*, Linné, *V. labrusca*, Linné, or *V. æstivalis*, Michaux.

Constituents.—Two varieties of wine, distinguished by their color as red wine (*Vinum rubrum*) and white wine (*Vinum album*), are represented in the U. S. P. When pure, port wine and sherry wine are the best representatives of this class, but, as they are often adulterated, a judicious selection from other wines will best serve the purpose of the physician. The qualities to be considered in such selection are astringency, from *tannin*; acidity, from *acid tartrate of potassium*; sweetness, from *sugar*; bouquet, or aroma, from *cænanthic acid*, *cænanthic ether*,

and perhaps other acids and ethers and stimulant properties dependent on amount of *alcohol* present. A *gum-like principle*, analogous to dextrine, confers on wines what is termed the "body." The constituents indicated are those of medical interest, and vary widely in different wines. Tannin exists in much larger proportion in red than in white wines, and the former are therefore the more astringent.

Light red wines contain from 10 to 15 per cent. of alcohol and are astringent. French clarets, American California port wines, Ives seedling, Concord, and red Rhine wines may be thus classed.

Heavy red wines, of which port wine is the type, are usually fortified by the addition of alcohol sufficient to increase its alcoholic strength from 18 to 25, or even to 30 per cent. 6 to 7 per cent. of sugar is present; and the character termed "body" is more apparent than in the lighter red wines.

Sparkling wines are such as sparkle or foam on pouring, from the escape of carbonic acid gas, with which they are impregnated. Such wines are partly fermented after bottling, the gas resulting giving the peculiar character. These wines contain 8 to 10 per cent. of alcohol, are, some of them, quite sweet, as champagne, sparkling catawba, while sparkling varieties containing less sugar and alcohol are known as sparkling hocks.

Still wines are such as are devoid of sparkling character, and are subdivided into dry acid wines and sweet wines.

Dry acid wines, or, as they are usually termed, simply dry wines, contain but little sugar, and are more or less acid to the taste. The German Rhine wines, still Catawbias, and Moselle wines are the best representatives of this class.

Sweet wines contain much sugar and but little alcohol, unless they have been fortified by its addition. Angelica, Malaga, Muscatel, California Muscatel, and Madeira are examples. The latter, together with sherry, is often fortified by the addition of alcohol, and may contain from 18 to 25 per cent. by volume.

[Vinum Album Fortius, U. S. P., contains not less than 20 per cent. of alcohol by weight.]

Sherry wine is usually preferred for pharmaceutical uses.

Uses.—Useful as a stimulant in states of depression of function of the circulatory and nervous system, in adynamic fevers, and in early convalescence. Its action is more exhilarating and sustained than distilled spirits, and is less likely to disagree; but, like alcoholic liquids of all kinds, should be used judiciously, and not so frequently or in such quantity as to induce functional disturbance, or to render the patient

insensible to its influence in moderate amounts. It is best taken with meals when used during convalescence. See *Alcohol*.

VIOLA ODORATA. Sweet-scented Violet.

The fresh plant in flower.

Violaceæ.

Linné. Bentley and Trimen.

Constituents.—*Violin*, a feebly basic substance, which is yellowish and bitter, resembling emetia, but is more soluble in water; an odorous substance, probably a *volatile oil*, and coloring matters soluble in water. These are the constituents of most prominence. The color of a decoction changes to red with acids, and to green with alkalis.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 41, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 44, Part I.

Uses.—This drug has been compared to ipecac in action, and it undoubtedly directly influences the pulmonary and gastro-intestinal surfaces. Large doses induce purging and vomiting. Its most useful application is as a remedy for paroxysmal coughs characterized by spasm, dyspnœa, dry skin, and expectoration of clear, ropy, or jelly-like mucus. Whooping-cough, the spasmodic cough of measles, cough and hoarseness from sudden chilling of skin, etc., come within its curative scope. The drug will doubtless repay further study.

V. pedata, *Lin.*, and *V. cucullata*, *Aiton*, doubtless possess similar virtues, and may be prepared and used in the same manner and dose.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to x. = gm. 0.06 to 0.66, or equivalent.

VIOLA TRICOLOR. Wild Pansy.

The fresh wild plant in flower.

Violaceæ.

Linné.

Constituents.—A *bitter principle*, *resin*, *mucilage*, *sugar*, and the other constituents common to all plants.

Violin has not been obtained from this species, which, however, resembles others in being emetic and purgative in large doses. (See *V. odorata*.)

Preparations.—The imported homœopathic tincture (essence), made from the fresh plant. The cultivated pansy of this country is not reliable.

Uses.—An efficacious remedy in various obstinate chronic eruptions of the skin, and correlated functional disturbances characterized by excessive itching when warm (as in bed), and secretion of high-colored urine or strong odor (suggesting cat's urine), usually in less than nor-

mal quantity. Impetigo, favus, crusta lactea, eczema, the diseases arising from suppressed eruptions, or those requiring the depurative action of the kidneys, as chronic rheumatic, or even syphilitic, affections, often present the conditions for the use of this drug.

Dose.—Tincture, gtt. j. to xv. = gm. 0.06 to 1.00.

VISCUM ALBUM. Mistletoe.

The fresh bark.

Loranthaceæ.

Linné.

Constituents.—*Resin*, an odorous principle, a little tannin, fixed oil, mucilage, sugar; and *viscin*, a tenacious substance, sometimes called birdlime. The latter exists in but small amount in the recent plant, but a larger quantity forms by a sort of fermentation.

Preparations.—A tincture, $\frac{N}{I}$, as in Sec. 42, Part I.

A tincture, $\frac{N}{2}$, as in Sec. 45, Part I.

Uses.—These are not well defined. It has long been employed as a remedy in epilepsy, and is said to be efficient in cases characterized by almost constant vertigo, pressure upon the vault of the skull, and constant agitation of the muscles of the face. It has also been used in periodical neuralgia, chorea from fright, uterine spasm, and menorrhagia. The drug deserves further study.

The *V. flavescens*, *Pursh* (Phoradendron, *Nuttall*), is an analogous or possibly identical American species, which may be prepared for use in the same manner.

Dose.—Tincture, $\frac{N}{I}$, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent, to water ʒiv . Teaspoonful doses (gm. 4.00).

XANTHORRHIZA APIIFOLIA. Yellow Root.

The dried rhizome and roots.

Ranunculaceæ.

L. Heritier. Bentley and Trimen.

Constituents.—No complete analysis has been made, although *berberina* has been determined as an important constituent.

Preparations.—A tincture, $\frac{N}{I}$, with diluted alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with diluted alcohol, as in Sec. 43, Part I.

Uses.—This drug, which is sometimes confounded with hydrastis, on account of its common name, has also been considered its equivalent. It has been chiefly employed, in infusion, as a wash for nursing sore mouth, and as a tonic in gastro-intestinal atony.

Dose.—Tincture, $\frac{N}{I}$, gtt. x. to xv. = gm. 0.66 to 1.00, or equivalent.

XANTHOXYLUM FRAXINEUM. Prickly Ash.

The dried bark. (X. Americanum. *Miller.*)

The dried recent berries.

Rutacæ, Xanthoxyleæ.

Wildenow.

Constituents.—A crystalline principle, *xanthoxylin*, which has not been fully studied, greenish *fixed oil*, *resin*, a small amount of *volatile oil*, are the constituents of interest. The berries contain larger amounts of the oily constituents.

Preparations.—From both bark and berries:

A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

Uses.—A diffusible stimulant of great power, directly and especially influencing mucous surfaces, on which it acts both topically and after absorption. In states of relaxation and hypersecretion of these tissues, such as are present in choleraic diseases, dysentery, diarrhœa, etc., it will be found a useful remedy. The tincture of the berries is usually preferable in these and similar cases. The tincture of the bark may be employed as a general stimulant in torpid conditions of the muscular system, and for glandular and circulatory inactivity.

The Southern prickly ash (X. Carolinianum, *Lambert*), has the same properties, and may be similarly prepared and employed.

Dose.—Tincture, $\frac{N}{1}$, of bark, gtt. j. to xv. = gm. 0.06 to 1.00, or equivalent, and about half the amount of the tinctures of the berries.

XYLOL, C_8H_{10} . M. wt. 106. **Xylol.**

Pure xylol obtained from wood-spirit, as a colorless, oily, thin liquid, of burning taste and peculiar odor, suggesting that of benzol. It boils at $126.2^\circ C.$ ($259^\circ F.$).

Solubility.—Insoluble in water, freely soluble in alcohol.

Uses.—As an application in gargle, wash, or spray to the throat, and as a wash to the skin in cases of small-pox. It is said to diminish fetor, mitigate the pain, and moderate the swelling and eruption in that disease.

Dose.—Gtt. iij. to xv. = gm. 0.20 to 1.00, suspended in mucilage or syrup. Its local use is preferable.

ZINCI ACETAS, $Zn(C_2H_3O_2)_2 \cdot 3H_2O$. M. wt. 237. **Acetate of Zinc.**

The pure salt in white, hexagonal plates or pearly scales. It loses acid and water on exposure, and the crystals lose transparency. It should be kept in well-stopped bottles.

Solubility.—Soluble in hot ($\frac{1}{2}$ part) and cold (3 parts) water, and in boiling (1 part) and cold alcohol (30 parts).

Tests.—*Other metals*; colored instead of white precipitate, obtained by passing sulphuretted hydrogen through an aqueous solution, and fixed residue on evaporation of filtrate from same. *Chlorides*; white precipitate with solution of silver nitrate. *Sulphates*; white precipitate with solution of barium nitrate. When liquor ammonia is added in excess to an aqueous solution, no permanent precipitate should remain.

Uses.—Not used internally. Locally, it is an irritant or astringent, according to strength of application. It is employed as a local application in gonorrhœa, leucorrhœa, and conjunctivitis. In the latter, one or two grains to each fluidounce of water may be employed. It is usually formed extemporaneously for the first two diseases by mixing equal parts of acetate of lead and sulphate of zinc in sufficient water. The sulphate of lead formed in this process probably modifies the action of the acetate of zinc, especially if the mixture is shaken when used.

ZINCI BROMIDUM, ZnBr_2 . M. wt. 225. Bromide of Zinc.

The salt in white, deliquescent granules or powder, which has a sweetish followed by an astringent taste. When heated, it first melts and then sublimes, condensing in white needles. Should be kept in well-stopped bottles.

Solubility.—Freely soluble in water, alcohol, and ether.

Tests.—Completely precipitate an aqueous solution with ammonium sulphide, and filter. Test the filtrate as follows: *Calcium*; white precipitate with ammonium oxalate. *Sodium, potassium, etc.*; residue on evaporation to dryness and ignition.

Uses.—Administered on theoretical grounds as a remedy in epilepsy and epileptiform diseases.

ZINCI CARBONAS PRÆCIPITATA, $(\text{ZnCO}_3)_2 \cdot 3\text{Zn}_2\text{HO}$. M. wt. 547. Precipitated Carbonate of Zinc.

The pure salt in soft, inodorous, and tasteless white powder. It should yield, when heated to redness in a crucible, 70 per cent. of oxide of zinc. The composition varies somewhat with the temperature and amount of water used in preparation.

Solubility.—Insoluble in water, readily soluble in dilute mineral acids and in acetic acid.

Tests.—Test a solution in dilute nitric acid as follows: *Sulphates*;

white precipitate with solution of barium nitrate. *Chlorides*; white precipitate with solution of silver nitrate. *Calcium salts*; white precipitate when mixed with an excess of carbonate of ammonium solution; when pure, any precipitate would be redissolved. *Magnesia*; white, crystalline precipitate from clear liquid of previous test, on adding a drop of phosphoric acid.

Preparations.—A cerate, $\frac{N}{3}$, with simple cerate as a basis, as in Sec. 17, Part I.

Uses.—Chiefly used in powder or cerate, as an astringent application to excoriations, burns, scalds, superficial erosions, ulcers, etc., where a moderate astringent action is desired, in addition to protection from contact with air. Not used internally.

ZINCI CHLORIDUM, $ZnCl_2$. M. wt. 136. Chloride of Zinc.

The pure fused salt in granular, white powder, or opaque fragments or tablets. Must be kept in well-stopped bottles, as it readily deliquesces.

Solubility.—Soluble in water to a turbid solution (from presence of oxychloride); soluble also in alcohol, and to a less extent in ether.

Tests.—*Alumina, iron, calcium, etc.*; precipitates instead of clear solution on addition of excess of carbonate of ammonium to a solution of the chloride. *Magnesium*; precipitate from filtrate of previous test on addition of phosphoric acid. *Potassium and sodium*; residue on evaporation and ignition of same from filtrate after complete precipitation with sulphhydrate of ammonium. *Lead and other metals*; colored precipitates on passing sulphuretted hydrogen through a solution acidulated with hydrochloric acid.

Preparations.—A solution, $\frac{N}{3}$, specific gravity 1.33, as follows:

Take of Fused chloride of zinc, <i>one part</i>	1
Water, <i>two parts</i>	2

Dissolve the salt in the water.

[Liq. Zinci Chloridi, U. S. P., is of specific gravity 1.553.]

Uses.—Employed in solution as a disinfectant and deodorizer for cesspools, sinks, water-closets, drains, hospitals, etc. The deliquesced salt has been extensively used as a component of cancer pastes, or alone as a caustic for the removal of malignant and morbid growths. Though there is no risk of poisoning from absorption or of hemorrhage from the use of this caustic, the pain is great, and requires the use of anæsthetics or narcotics for some time. Its action is limited to the tissue with which it is in contact, and which it causes to shrivel up, become

mummified, and finally slough off. Care should be used to apply it only to tissue to be removed, and to regulate its amount so that it does not penetrate too deeply. Rye flour, powdered *ulmus fulva*, wheat flour, and gutta-percha have been added in various amounts, for the purpose of tempering its action.

ZINCI IODIDUM, ZnI_2 . M. wt. 319. Iodide of Zinc.

The salt in odorless, white, deliquescent, granular powder, or in cubic crystals. Keep in well-stopped bottles.

Solubility.—Freely soluble in water and alcohol.

Tests.—Should show no impurities when tested as with zinc bromide.

Preparations.—A syrup as follows :

Take of Granulated zinc, <i>twenty-five parts</i>	.	.	.	.	.	25
Iodine, <i>eighty-two parts</i>	.	.	.	.	.	82
Sugar, <i>six hundred parts</i>	.	.	.	.	.	600
Distilled water, a <i>sufficient quantity</i>	.	.	.	.	.	q. s.

Digest the zinc in bottle or flask with the iodine and 200 parts of water, agitating occasionally, until the color of iodine has disappeared. Filter into a bottle containing the sugar, rinse the vessel with 90 parts of water, and pass the rinsings through the filter with sufficient additional water to make the total weight *one thousand (1000) parts*.

Lastly, agitate until the sugar has dissolved. Strain, if required.

This syrup has the same iodine strength as *Ferri Iodidi syrup*, and contains about 10.3 per cent. of zinci iodide.

Uses.—It has been usefully employed in choeraic and hysterical disorders, and internally and locally, for glandular affections of scrofulous origin.

Dose.—Gtt. xx. to xxx. = gm. 1.33 to 2.00 of the syrup, three times a day. Locally, to swollen glands (in solution grs. xv. to xxx. = gm. 1.00 to 2.00 to water $\bar{3}$ j. = gm. 32.00).

ZINCI OXIDUM, ZnO . M. wt. 81. Oxide of Zinc.

The pure oxide in soft, yellowish-white, inodorous, and tasteless powder. Should be kept in well-stopped containers, as it gradually absorbs moisture, and carbonic dioxide from the air.

Solubility.—Insoluble in water and alcohol, soluble in dilute acids.

Tests.—*Chlorides*; white precipitate on adding silver nitrate to solution of the oxide in dilute nitric acid. *Sulphates*; white precipitate

on adding barium nitrate to solution in dilute nitric acid. *Iron*; red color on adding solution of sulphocyanide of potassium to a solution of the oxide in hydrochloric acid. *Lead and other metals*; discoloration or precipitate in solution in hydrochloric acid on adding sulphuretted hydrogen. *Calcium*; white precipitate with ammonium oxalate, when added to liquid obtained by adding excess of sulphhydrate of ammonium to the solution of the oxide in hydrochloric acid, boiling and filtering. *Magnesium*; white precipitate on addition of ammonium phosphate to filtrate obtained as in previous test.

Preparations.—An ointment, $\frac{N}{5}$, using adeps benzoinatis as a basis, as in Sec. 50, Part I.

[Unguentum Zinci Oxidi, U. S. P. = $\frac{N}{5}$.]

Uses.—Locally, in powder or ointment, as an astringent and stimulant application to unhealthy ulcers, fissures, intrerigo, burns, scalds, etc., and suspended in mucilaginous mixture, in blenorrrhagia, leucorrhœa, etc.

It is rarely employed internally, though it is recommended to control colliquative sweats, diarrhœa, and dysentery, headaches, and other affections arising from nervous exhaustion or depression. Its internal employment requires further study.

Dose.—Grs. j. to iij. = gm. 0.06 to 0.20, after eating.

ZINCI PHOSPHIDUM, Zn_3P_2 . M. wt. 257. Phosphate of Zinc.

The salt in grayish, friable pieces, whose freshly-fractured surfaces have a metallic lustre. Its composition varies somewhat, but, when pure, it contains phosphorus 24.12 per cent., zinc 75.88 per cent. It dissolves only in acids, evolving phosphuretted hydrogen copiously.

Preparations.—A trituration, $\frac{N}{10}$ to $\frac{N}{100}$, as in Sec. 49, Part I.

Uses.—The true remedial value of this drug is not clearly defined. It is recommended chiefly in those nervous disorders dependent on deficient nutrition of brain and spinal cord, notably paralysis and loco-motor ataxia.

In minute doses (trit. $\frac{N}{100}$) it often proves useful in relieving the depression and sleeplessness of overworked business-men. Anæmia of the nerve-centres, which condition is manifested by vertigo, dizziness, undefined dread, twitching, and lack of muscular control, weakness and heaviness of limbs, pain in back of neck and head, binding and compressed feeling in the brow, etc., will often be promptly relieved by its use. It deserves study in minute doses.

Dose.—In pill, grs. $\frac{1}{8}$ to $\frac{1}{16}$ = gm. 0.004 to 0.008, or in one-grain doses of trituration, $\frac{N}{10}$ to $\frac{N}{103}$.

ZINCI SULPHAS, $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$. M. wt. 287. Sulphate of Zinc.

The salt in small prismatic crystals, isomeric with those of magnesium sulphate. It should yield, upon analysis, 43.9 per cent. of water and 28.22 per cent. of zinc oxide.

Solubility.—Freely soluble in water, slightly in dilute, but insoluble in alcohol if strong.

Tests.—To an aqueous solution add ammonium sulphide in excess and filter. Test this filtrate as follows: *Salts of magnesium, sodium, etc.*; residue on evaporating to dryness and igniting. *Copper and arsenic*; coloration or precipitate with sulphuretted hydrogen. *Iron*; bluish precipitate with potassium ferrocyanide.

Uses.—Internally, as an emetic to promptly relieve the stomach of poisonous or irritant ingesta.

Locally, as an astringent to diminish secretion, and as a stimulant to quicken granulation in ulcers or to provoke vital reaction in relaxed and catarrhal states of mucous surfaces.

Ulcers and soft tumors may be beneficially treated by this agent in powder or ointment made by mixing sufficient lard with the powder to hold it together. It is mildly caustic, resembling the chloride, but much less active.

Dose.—As an emetic, grs. x. to 3j. = gm. 0.66 to 4.00, in warm water.

ZINCI VALERIANAS, $\text{Zn}(\text{C}_5\text{H}_9\text{O}_2)_2 \cdot \text{H}_2\text{O}$. M. wt. 285. Valerianate of Zinc.

The pure salt in soft, white scales of pearly appearance, sweet and astringent taste, and slight odor of valerianic acid.

Solubility.—Moderately soluble in water, more freely in alcohol, and to an extent in ether.

Tests.—If completely soluble in ammonium hydrate, and if the filtrate from the aqueous solution after precipitation with excess of sulphuretted hydrogen and evaporation to dryness leaves no residue, the salt is probably pure.

Preparations.—Triturations, $\frac{N}{10}$ to $\frac{N}{103}$, as in Sec. 49, Part I.

Uses.—A useful remedy in neuralgias and nervous symptoms of

hysterical and sensitive women, accompanying or dependent on derangement of the reproductive organs.

Dose.—Grs. j. = gm. 0.06 in pill, or trituration, $\frac{N}{10}$ to $\frac{N}{100}$.

ZINCUM, Zn. A. wt. 65. Zinc.

Metallic zinc in thin sheets or irregular granulated pieces; specific gravity 6.9; of bluish-white color.

Solubility.—Freely soluble to a colorless solution in diluted hydrochloric and sulphuric acids.

Tests.—*Arsenic*; black stain on cap of paper wet with a drop of solution of silver nitrate, and fitted to a test-tube in which the metal is being dissolved in pure diluted sulphuric acid.

Uses.—For the preparation of zinc salts only.

ZINGIBER OFFICINALE. Ginger.

The rhizome. (*Amomum Zingiber*. Linné.)

Zingiberaceæ.

Roscoe. Bentley and Trimen.

Constituents.—*Volatile oil*; soft, pungent *resin*; *starch* and *gum*.

Preparations.—A tincture, $\frac{N}{1}$, with alcohol, as in Sec. 40, Part I.

A tincture, $\frac{N}{2}$, with alcohol, as in Sec. 43, Part I.

[Tinctura Zingiberis, U. S. P. = $\frac{N}{5}$.]

Uses.—A useful stimulant to the gastro-intestinal mucous surfaces. It is extensively employed in relaxed and catarrhal states of these tissues, and to correct flatulence caused by ingesta in a state of decomposition.

Dose.—Grs. v. to xxx. = gm. 0.33 to 2.00, or equivalent.

CONDENSED TABLE FOR ACIDS,

SHOWING

PERCENTAGE OF REAL ACID AND SPECIFIC GRAVITY, AT 15° C. (59° F.), IN
SOLUTIONS OF THE MOST IMPORTANT ACIDS.

(After Oudemans, Biel, Otto and Kolb.)

Real Acid.	Acetic Acid ($\text{HC}_2\text{H}_3\text{O}_2$).	Hydrobromic Acid (HBr).	Phosphoric Acid, H_3PO_4 .	Sulphuric Acid, H_2SO_4 .	Hydrochloric Acid, HCl .		Nitric Acid, HNO_3 .	
Per ct.	Sp. Gravity.	Sp. Gravity.	Sp. Gravity.	Sp. Gravity.	Per ct.	Sp. Gr.	Per ct.	Sp. Gr.
1	1.0007	1.0082	1.0054	1.0064	0.1	1.000	0.2	1.000
2	1.0022	1.0155	1.0109	1.0130	1.5	1.007	1.5	1.007
3	1.0037	1.0230	1.0164	1.0190	2.9	1.014	2.6	1.014
4	1.0052	1.0305	1.0220	1.0256	4.5	1.022	4.0	1.022
5	1.0067	1.038	1.0276	1.0320	5.8	1.029	5.1	1.029
6	1.0083	1.046	1.0333	1.0390	7.3	1.036	6.3	1.036
7	1.0098	1.053	1.0390	1.0464	8.9	1.044	7.6	1.044
8	1.0113	1.061	1.0449	1.0536	10.4	1.052	9.0	1.052
9	1.0127	1.069	1.0508	1.0610	12.0	1.060	10.2	1.060
10	1.0142	1.077	1.0567	1.0680	13.4	1.067	11.4	1.067
11	1.0157	1.085	1.0627	1.0756	15.0	1.075	12.7	1.075
12	1.0171	1.093	1.0688	1.0830	16.5	1.083	14.0	1.083
13	1.0185	1.102	1.0749	1.0910	18.1	1.091	15.3	1.091
14	1.0200	1.110	1.0811	1.0980	19.9	1.100	16.8	1.100
15	1.0214	1.119	1.0874	1.1060	21.5	1.108	18.0	1.108
16	1.0228	1.127	1.0937	1.1136	23.1	1.116	19.4	1.116
17	1.0242	1.136	1.1001	1.1210	24.8	1.125	20.8	1.125
18	1.0256	1.145	1.1065	1.1290	26.6	1.134	22.2	1.134
19	1.0270	1.154	1.1130	1.1360	28.4	1.143	23.6	1.143
20	1.0284	1.163	1.1196	1.1440	30.2	1.152	24.9	1.152
21	1.0298	1.172	1.1262	1.1516	31.2	1.157	26.3	1.161
22	1.0311	1.181	1.1329	1.1590	32.0	1.161	27.8	1.171
23	1.0324	1.190	1.1397	1.1670	33.0	1.166	29.2	1.180
24	1.0337	1.200	1.1465	1.1740	33.9	1.171	30.7	1.190
25	1.0350	1.209	1.1534	1.1820	34.7	1.175	32.1	1.199
26	1.0363	1.219	1.1604	1.1900	35.7	1.180	33.8	1.210
27	1.0375	1.229	1.1674	1.1980	36.8	1.185	35.5	1.221
28	1.0388	1.239	1.1745	1.2066	37.9	1.190	37.0	1.231
29	1.0400	1.249	1.1817	1.2150	39.0	1.195	38.6	1.242
30	1.0412	1.260	1.1889	1.2230	39.8	1.199	40.2	1.252
31	1.0424	1.270	1.1960	1.2310	41.2	1.205	41.5	1.261
32	1.0436	1.281	1.2036	1.2390	42.4	1.210	43.5	1.275
33	1.0447	1.292	1.2111	1.2476	42.9	1.212	45.0	1.286
34	1.0459	1.303	1.2186	1.2560	.....	.....	47.1	1.298
35	1.0470	1.314	1.2262	1.2640	.....	.....	48.6	1.309
36	1.0481	1.326	1.2338	1.2720	.....	.....	50.7	1.321
37	1.0492	1.338	1.2415	1.2810	.....	.....	52.9	1.334
38	1.0502	1.350	1.2493	1.2890	.....	.....	55.0	1.346
39	1.0513	1.362	1.2572	1.2976	.....	.....	57.3	1.359
40	1.0523	1.375	1.2651	1.3060	.....	.....	59.6	1.372
41	1.0533	1.388	1.2731	1.3150	.....	.....	61.7	1.384
42	1.0543	1.401	1.2812	1.3240	.....	.....	64.5	1.398
43	1.0552	1.415	1.2894	1.3330	.....	.....	67.5	1.412
44	1.0562	1.429	1.2976	1.3420	.....	.....	70.6	1.426
45	1.0571	1.444	1.3059	1.3510	.....	.....	74.4	1.440
46	1.0580	1.459	1.3143	1.3610	.....	.....	78.4	1.454

TABLE FOR ACIDS—(Continued).

Real Acid.	Acetic Acid ($\text{HC}_2\text{H}_3\text{O}_2$).	Hydrobromic Acid (HBr).	Phosphoric Acid, H_3PO_4 .	Sulphuric Acid, H_2SO_4 .	Hydrochloric Acid, HCl .		Nitric Acid, HNO_3 .	
Per ct.	Sp. Gravity.	Sp. Gravity.	Sp. Gravity.	Sp. Gravity.	Per ct.	Sp. Gr.	Per ct.	Sp. Gr.
47	1.0589	1.474	1.3227	1.3700	.....	.....	83.0	1.470
48	1.0598	1.490	1.3310	1.3790	.....	.....	87.1	1.481
49	1.0607	1.496	1.3399	1.3866	.....	.....	92.6	1.501
50	1.0615	1.513	1.3486	1.3980	.....	.....	96.0	1.516
51	1.0623	.....	1.3573	1.4080	.....	.....	98.0	1.524
52	1.0631	.....	1.3661	1.4180	.....	.....	100.0	1.530
53	1.0638	.....	1.3750	1.4280				
54	1.0646	.....	1.3840	1.4380				
55	1.0653	.....	1.3931	1.4480				
56	1.0660	.....	1.4022	1.4586				
57	1.0666	.....	1.4114	1.4690				
58	1.0673	.....	1.4207	1.4800				
59	1.0679	.....	1.4301	1.4900				
60	1.0685	.....	1.4395	1.5010				
61	1.0691	.....	.....	1.5120				
62	1.0697	.....	.....	1.5230				
63	1.0702	.....	.....	1.5340				
64	1.0707	.....	.....	1.5450				
65	1.0712	.....	.....	1.5570				
66	1.0717	.....	.....	1.5860				
67	1.0721	.....	.....	1.5900				
68	1.0725	.....	.....	1.5920				
69	1.0729	.....	.....	1.6040				
70	1.0733	.....	.....	1.6150				
71	1.0737	.....	.....	1.6270				
72	1.0740	.....	.....	1.6390				
73	1.0742	.....	.....	1.6510				
74	1.0744	.....	.....	1.6630				
75	1.0746	.....	.....	1.6750				
76	1.0747	.....	.....	1.6860				
77	1.0748	.....	.....	1.6980				
78	1.0748	.....	.....	1.7100				
79	1.0748	.....	.....	1.7220				
80	1.0748	.....	.....	1.7340				
81	1.0747	.....	.....	1.7450				
82	1.0746	.....	.....	1.7560				
83	1.0744	.....	.....	1.7670				
84	1.0742	.....	.....	1.7770				
85	1.0739	.....	.....	1.7860				
86	1.0736	.....	.....	1.7940				
87	1.0731	.....	.....	1.8020				
88	1.0726	.....	.....	1.8090				
89	1.0720	.....	.....	1.8160				
90	1.0713	.....	.....	1.8220				
91	1.0705	.....	.....	1.8270				
92	1.0696	.....	.....	1.8310				
93	1.0686	.....	.....	1.8340				
94	1.0674	.....	.....	1.8356				
95	1.0660	.....	.....	1.8376				
96	1.0644	.....	.....	1.8384				
97	1.0625	.....	.....	1.8400				
98	1.0604	.....	.....	1.8406				
99	1.0580	.....	.....	1.8420				
100	1.0553	.....	.....	1.8426				

TABLE

SHOWING A COMPARISON OF THE DEGREES OF BAUMÉ, CARTIER, AND BECK'S
AREOMETERS, WITH SPECIFIC GRAVITY DEGREES.

A.—For Liquids lighter than Water.

Degr. of Baumé, Car- tier, Beck.	Baumé.	Cartier.	Beck.	Degr. of Baumé, Car- tier, Beck.	Baumé.	Cartier.	Beck.
	Sp. Gr.	Sp. Gr.	Sp. Gr.		Sp. Gr.	Sp. Gr.	Sp. Gr.
0	.....	.....	1.0000	36	0.848	0.837	0.8252
1	.....	.....	0.9941	37	0.843	0.831	0.8212
2	.....	.....	0.9883	38	0.838	0.826	0.8173
3	.....	.....	0.9826	39	0.833	0.820	0.8133
4	.....	.....	0.9770	40	0.829	0.815	0.8095
5	.....	.....	0.9714	41	0.824	0.810	0.8061
6	.....	.....	0.9659	42	0.819	0.805	0.8018
7	.....	.....	0.9604	43	0.815	0.800	0.7981
8	.....	.....	0.9550	44	0.810	.....	0.7944
9	.....	.....	0.9497	45	0.806	.....	0.7907
10	1.000	.....	0.9444	46	0.801	.....	0.7871
11	0.993	1.000	0.9392	47	0.797	.....	0.7834
12	0.986	0.992	0.9340	48	0.792	.....	0.7799
13	0.979	0.985	0.9289	49	0.788	.....	0.7763
14	0.973	0.977	0.9239	50	0.784	.....	0.7727
15	0.967	0.969	0.9189	51	0.781	.....	0.7692
16	0.960	0.962	0.9139	52	0.776	.....	0.7658
17	0.954	0.955	0.9090	53	0.771	.....	0.7623
18	0.948	0.948	0.9042	54	0.769	.....	0.7589
19	0.942	0.941	0.8994	55	0.763	.....	0.7556
20	0.935	0.934	0.8947	56	0.759	.....	0.7522
21	0.929	0.927	0.8900	57	0.755	.....	0.7489
22	0.924	0.920	0.8854	58	0.751	.....	0.7456
23	0.918	0.914	0.8808	59	0.748	.....	0.7423
24	0.912	0.908	0.8762	60	0.744	.....	0.7391
25	0.906	0.901	0.8717	61	0.740	.....	0.7359
26	0.901	0.895	0.8673	62	0.736	.....	0.7328
27	0.895	0.889	0.8629	63	.....	.....	0.7296
28	0.889	0.883	0.8585	64	.....	.....	0.7265
29	0.884	0.877	0.8542	65	.....	.....	0.7234
30	0.879	0.871	0.8500	66	.....	.....	0.7203
31	0.873	0.865	0.8457	67	.....	.....	0.7173
32	0.868	0.859	0.8415	68	.....	.....	0.7142
33	0.863	0.853	0.8374	69	.....	.....	0.7112
34	0.858	0.848	0.8333	70	.....	.....	0.7083
35	0.853	0.842	0.8292				

TABLE SHOWING COMPARISON OF DEGREES—(Continued).

B.—For Liquids heavier than Water.

Degr. of Baumé, Beck.	Baumé.	Beck.	Degr. of Baumé, Beck.	Baumé.	Beck.	Degr. of Baumé, Beck.	Baumé.	Beck.
	Sp. Gr.	Sp. Gr.		Sp. Gr.	Sp. Gr.		Sp. Gr.	Sp. Gr.
0	1.000	1.000	25	1.205	1.1724	50	1.515	1.4167
1	1.007	1.0059	26	1.215	1.1806	51	1.531	1.4286
2	1.014	1.0119	27	1.225	1.1888	52	1.546	1.4407
3	1.020	1.0180	28	1.235	1.1972	53	1.562	1.4530
4	1.028	1.0241	29	1.245	1.2057	54	1.578	1.4655
5	1.034	1.0303	30	1.256	1.2143	55	1.596	1.4783
6	1.041	1.0366	31	1.267	1.2230	56	1.615	1.4912
7	1.049	1.0429	32	1.278	1.2319	57	1.634	1.5044
8	1.057	1.0494	33	1.289	1.2409	58	1.653	1.5179
9	1.064	1.0559	34	1.300	1.2500	59	1.671	1.5315
10	1.072	1.0625	35	1.312	1.2593	60	1.690	1.5454
11	1.080	1.0692	36	1.324	1.2680	61	1.709	1.5596
12	1.088	1.0759	37	1.337	1.2782	62	1.729	1.5741
13	1.096	1.0828	38	1.349	1.2879	63	1.750	1.5888
14	1.104	1.0897	39	1.361	1.2977	64	1.771	1.6038
15	1.113	1.0968	40	1.375	1.3077	65	1.793	1.6190
16	1.121	1.1039	41	1.388	1.3178	66	1.815	1.6346
17	1.130	1.1111	42	1.401	1.3281	67	1.839	1.6505
18	1.138	1.1184	43	1.414	1.3386	68	1.864	1.6667
19	1.147	1.1258	44	1.428	1.3492	69	1.885	1.6832
20	1.157	1.1333	45	1.442	1.3600	70	1.909	1.7000
21	1.166	1.1409	46	1.456	1.3710	71	1.935	.....
22	1.176	1.1486	47	1.470	1.3821	72	1.960	.....
23	1.185	1.1565	48	1.485	1.3934			
24	1.195	1.1644	49	1.500	1.4050			

TABLE SHOWING THE STRENGTH OF SOLUTIONS OF AMMONIA BY SPECIFIC GRAVITY AT 14° (? C.).

Specific Gravity	Per ct. of NH_3 .	Specific Gravity	Per ct. of NH_3 .	Specific Gravity	Per ct. of NH_3 .
.9959	1	.9484	13	.9106	25
.9915	2	.9449	14	.9078	26
.9873	3	.9414	15	.9052	27
.9831	4	.9380	16	.9026	28
.9790	5	.9347	17	.9001	29
.9749	6	.9314	18	.8976	30
.9709	7	.9283	19	.8953	31
.9670	8	.9251	20	.8929	32
.9631	9	.9221	21	.8907	33
.9593	10	.9191	22	.8885	34
.9556	11	.9162	23	.8864	35
.9520	12	.9133	24	.8844	36

TABLE SHOWING THE STRENGTH OF SOLUTIONS OF SODIUM AND OF POTASSIUM HYDRATE BY SPECIFIC GRAVITY AT 15° C.

Per cent.	Specific Gravity KHO.	Specific Gravity NaHO.	Per cent.	Specific Gravity KHO.	Specific Gravity NaHO.
5	1.036	1.059	40	1.411	1.437
10	1.077	1.115	45	1.445	1.488
15	1.124	1.170	50	1.539	1.540
20	1.175	1.225	55	1.604	1.591
25	1.230	1.279	60	1.667	1.643
30	1.288	1.332	65	1.729	1.695
35	1.349	1.738	70	1.790	1.748

TABLE OF PERCENTAGE OF ABSOLUTE ALCOHOL BY WEIGHT AND BY VOLUME IN SPIRITS AT DIFFERENT SPECIFIC GRAVITIES. TEMP. 15.6° C. (60° F.)

Specific Gravity.	Per ct. by Weight.	Per cent. by Volume.	Specific Gravity.	Per ct. by Weight.	Per cent. by Volume.	Specific Gravity.	Per ct. by Weight.	Per cent. by Volume.
0.9981	1	1.26	0.9490	35	41.84	0.8745	69	76.01
0.9965	2	2.51	0.9471	36	42.95	0.8721	70	76.91
0.9947	3	3.76	0.9452	37	44.06	0.8696	71	77.78
0.9930	4	5.00	0.9434	38	45.16	0.8672	72	78.66
0.9914	5	6.24	0.9416	39	46.26	0.8649	73	79.54
0.9898	6	7.48	0.9396	40	47.35	0.8625	74	80.40
0.9884	7	8.72	0.9376	41	48.43	0.8603	75	81.28
0.9869	8	9.95	0.9356	42	49.50	0.8581	76	82.16
0.9855	9	11.17	0.9335	43	50.57	0.8557	77	83.00
0.9841	10	12.40	0.9314	44	51.63	0.8533	78	83.85
0.9828	11	13.62	0.9292	45	52.68	0.8508	79	84.67
0.9815	12	14.84	0.9270	46	53.72	0.8483	80	85.49
0.9802	13	16.05	0.9248	47	54.76	0.8459	81	86.32
0.9789	14	17.26	0.9226	48	55.79	0.8434	82	87.12
0.9778	15	18.48	0.9204	49	56.82	0.8408	83	87.91
0.9766	16	19.68	0.9182	50	57.84	0.8382	84	88.70
0.9753	17	20.89	0.9159	51	58.85	0.8357	85	89.49
0.9741	18	22.09	0.9135	52	59.84	0.8331	86	90.26
0.9728	19	23.28	0.9113	53	60.85	0.8305	87	91.02
0.9716	20	24.48	0.9090	54	61.84	0.8279	88	91.78
0.9704	21	25.67	0.9069	55	62.84	0.8254	89	92.54
0.9691	22	26.86	0.9047	56	63.82	0.8228	90	93.29
0.9678	23	28.04	0.9025	57	64.80	0.8200	91	94.00
0.9665	24	29.22	0.9001	58	65.77	0.8172	92	94.71
0.9652	25	30.40	0.8979	59	66.74	0.8145	93	95.42
0.9638	26	31.57	0.8956	60	67.69	0.8118	94	96.13
0.9623	27	32.73	0.8932	61	68.64	0.8089	95	96.80
0.9609	28	33.89	0.8908	62	69.58	0.8061	96	97.49
0.9593	29	35.05	0.8886	63	70.52	0.8031	97	98.14
0.9578	30	36.20	0.8863	64	71.46	0.8001	98	98.78
0.9560	31	37.34	0.8840	65	72.38	0.7969	99	99.37
0.9544	32	38.47	0.8816	66	73.30	0.7938	100	100.00
0.9528	33	39.61	0.8793	67	74.22			
0.9511	34	40.74	0.8769	68	75.12			

RELATIONS OF METRIC, TROY, AND AVOIRDUPOIS WEIGHTS, EXPRESSED IN GRAMS, GRAINS, AND FRACTIONS THEREOF.

Grams.	Equivalent in Grains.	Equivalent in Drachms.	Grains.	Equivalent in Grams.	Drachms Troy.	Equivalent in Grams.	Ounces Troy.	Equivalent in Grams.	Ounces Avoirdupois.	Equivalent in Grams.
1	15.432	0.25	1	0.0648	1	3.888	1	31.103	1	28.350
2	30.865	0.51	2	0.1296	2	7.776	2	62.207	2	56.699
3	46.297	0.70	3	0.1944	3	11.664	3	93.310	3	85.049
4	61.729	1.02	4	0.2592	4	15.552	4	124.414	4	113.398
5	77.162	1.28	5	0.3239	5	19.444	5	155.517	5	141.748
6	92.594	1.54	6	0.3887	6	23.328	6	186.621	6	170.098
7	108.026	1.80	7	0.4535	7	27.216	7	217.724	7	198.447
8	123.459	2.05	8	0.5183	8	31.103	8	248.823	8	226.796
9	138.891	2.30	9	0.5831	9	34.991	9	279.931	9	255.146
10	154.323	2.57	10	0.6479	10	38.094	10	311.035	10	283.496

NOTE.—For approximations, see following table.

RELATIONS OF METRICAL MEASURES OF CAPACITY AND FLUID MEASURE [U. S. P.], EXPRESSED IN CUBIC CENTIMETERS, MINIMS, AND FRACTIONS THEREOF.

1 cubic centimeter = 0.6103 cubic inches. 1 minim = .00376 cubic inches. 1 fluidrachm = 3.6962 cubic centimeters.

Cub. Centimeters.	Equivalent in Minims.	Equivalent in Fluidrachms.	Equivalent in Fluidounces.	Minims.	Equivalent in Cub. Centimeters.	Fluidrachms.	Equivalent in Cub. Centimeters.	Fluidounces.	Equivalent in Cub. Centimeters.	Approximations to Metric and Troy Weights and Measures.
1	16.23	0.27	0.03	1	0.06	1	3.70	1	29.57	1 troy grain = 0.06.
2	32.46	0.54	0.06	2	0.12	2	7.39	2	59.10	1 tr. gr. = 6 centigrams
3	48.69	0.81	0.09	3	0.18	3	11.09	3	88.67	1 drachm = 4 grams.
4	64.80	1.08	0.13	4	0.25	4	14.79	4	118.24	1 tr. oz. = 30 grams.
5	81.00	1.35	0.17	5	0.31	5	18.48	5	147.81	1 minim = $\frac{1}{15}$ c.c.
6	97.20	1.62	0.20	6	0.37	6	22.18	6	177.39	1 fluidrachm = $\frac{1}{4}$ c.c.
7	113.40	1.89	0.23	7	0.43	7	25.88	7	206.96	1 fluid oz. = 30 c.c.
8	129.60	2.16	0.27	8	0.49	8	29.57	8	236.53	1 minim = $\frac{1}{15}$ c.c.
9	145.80	2.43	0.30	9	0.55	9	33.27	9	266.10	The average drop equals $\frac{1}{20}$ of a c.c.
10	162.60	2.71	0.33	10	0.62	10	36.97	10	295.68	

NOTE.—The approximate equivalents used to express the dose of liquids, as given in Part II., are based upon the practical identity in weight of the c.c. and gram (gramme), and accord with the common usage, except that in this work the drop, when used, is considered equal to the minim, though in reality less. (See remarks under Dose, in Part I.)

RULES FOR DILUTING ALCOHOL.

(After W. C. Tidball, "New Remedies," January, 1880.)

1. *Given a certain weight of alcohol of a known per cent., to dilute to an alcohol of a required per cent.*

Let x = weight of alcohol to be made; then

$$\begin{array}{ccccccc} \text{Required} & : & \text{Known} & : : & \text{Weight of alcohol} & : & x. \\ \text{per cent.} & & \text{per cent.} & & \text{to be diluted} & & \end{array}$$

Whence

$$x = \frac{\text{Weight of alcohol to be diluted} \times \text{Per cent. of alcohol to be diluted}}{\text{Per cent. of alcohol to be made}}.$$

Then

$$x - (\text{Weight of alcohol to be diluted}) = \text{Weight of water to be added.}$$

2. *Given an alcohol of known per cent., to make a certain weight of an alcohol of a required per cent. What weight of the alcohol of known per cent. and what weight of water must be used?*

Let x = weight of alcohol to be diluted; then

$$\begin{array}{ccccccc} \text{Known} & : & \text{Required} & : : & \text{Weight} & : & x. \\ \text{per cent.} & & \text{per cent.} & & \text{to be made} & & \end{array}$$

Whence

$$\frac{\text{Weight to be made} \times \text{Required per cent.}}{\text{Known per cent.}} = x.$$

Then

$$(\text{Weight to be made}) - x = \text{Weight of water to be added.}$$

3. *Given a certain weight of alcohol of known per cent., to make an alcohol of intermediate per cent., by adding an alcohol of greater or less known per cent.*

$$\frac{\left(\begin{array}{c} \text{Per cent. of} \\ \text{required alcohol} \end{array} \right) - \left(\begin{array}{c} \text{Per cent. of} \\ \text{alcohol given} \end{array} \right)}{\left(\begin{array}{c} \text{Required per cent.} \\ \text{to be added} \end{array} \right) - \left(\begin{array}{c} \text{Per cent. of} \\ \text{alcohol to be added} \end{array} \right)} \times \left(\begin{array}{c} \text{Weight of} \\ \text{alcohol given} \end{array} \right) = \text{Weight of alcohol to be added.}$$

4. *Given two alcohols of different strengths. What weight of each must be mixed to make a required weight of alcohol of a required per cent.?*

$$\frac{\left(\begin{array}{c} \text{Required} \\ \text{weight of} \\ \text{mixture} \end{array} \right) \times \left(\begin{array}{c} \text{Required} \\ \text{per cent.} \\ \text{of mixture} \end{array} \right) - \left(\begin{array}{c} \text{Required} \\ \text{weight of} \\ \text{mixture} \end{array} \right) \times \left(\begin{array}{c} \text{Per cent. of} \\ \text{weaker of} \\ \text{given alcohols} \end{array} \right)}{\left(\begin{array}{c} \text{Per cent. of stronger} \\ \text{given alcohol} \end{array} \right) - \left(\begin{array}{c} \text{Per cent. of weaker} \\ \text{given alcohol} \end{array} \right)} = \left(\begin{array}{c} \text{Required weight} \\ \text{of stronger} \\ \text{alcohol} \end{array} \right)$$

Then

$$\left(\begin{array}{c} \text{Required weight} \\ \text{of mixture} \end{array} \right) - \left(\begin{array}{c} \text{Required weight} \\ \text{of stronger alcohol} \end{array} \right) = \left(\begin{array}{c} \text{Required weight} \\ \text{of weaker alcohol} \end{array} \right).$$

REAGENTS FOR LABORATORY USE

AND AS

TESTS FOR IMPURITIES IN CHEMICALS.

Whenever water is mentioned for solutions, distilled water is meant.

When not otherwise specified, the substance as described in Part II. of this work is meant.

ACIDS.

Acetic. The acid, specific gravity 1.040 to 1.047.

Acetic, dilute. The acid mixed with its weight of water.

Boracic. The acid dissolved in 8 parts of alcohol.

Bromine. Bromine dissolved in 40 parts of water.

Carbonic. The acid formed by passing carbonic dioxide (CO_2) into cold water.

Chlorine. Aqua chlorinii, as described in Part II.

Hydrochloric. The pure acid, specific gravity 1.12 to 1.16.

Hydrochloric, dilute. The pure acid mixed with 3 parts of water.

Nitric. The pure acid, specific gravity 1.185.

Nitric, dilute. The pure acid mixed with 2 parts of water.

Nitro-hydrochloric (Aqua Regia). Mix 4 parts hydrochloric with 1 part of nitric acid. Prepare as wanted.

Oxalic. The acid purified by recrystallization dissolved in 10 parts of water.

Sulphuric. The acid, specific gravity 1.830 to 1.840.

Sulphuric, dilute. The acid, specific gravity 1.082 to 1.094, or pour 1 part pure acid into 5 parts of water.

Sulphurous. The acid as described in Part II.

Sulphydric. Sulphuretted hydrogen generated, as used, from sulphide of iron and diluted sulphuric acid.

Tannic. The acid dissolved in a mixture of alcohol 1 part, water 9 parts.

Tartaric. The acid dissolved in alcohol 2 parts, water 8 parts.

SALTS OR SOLUTIONS THEREOF.

Ammonic Arseniate. A solution of the salt prepared by neutralizing arsenic acid with ammonic carbonate, evaporating to dryness and redissolving.

Ammonic Carbonate, neutral. A solution of the commercial salt in 4 parts of water and 1 part of ammonium hydrate, specific gravity .960.

Ammonic-hydric Carbonate. The crystalline salt obtained by passing carbonic dioxide (CO_2) into strong ammonium hydrate. Dissolve as needed.

Ammonic Chloride. The purified salt dissolved in 10 parts of water.

Ammonic Hydrate. Ammonia water, specific gravity .960.

Ammonic Molybdate. A solution of the salt (gm. 60.00) in strong ammonia water, specific gravity .960 (400 c.c.), and water (400 c.c.) poured into strong nitric acid, specific gravity 1.4 (500 c.c.), or sufficient until the precipitate which first forms redissolves.

Ammonio Nitrate. A saturated solution of the salt, prepared as wanted.

Ammonio Oxalate. The salt recrystallized and dissolved in 20 parts of water.

Ammonic-hydric Phosphate. Neutralize dilute phosphoric acid, as described in Part II., with ammonia water, and evaporate, keeping the ammonia in slight excess. Dissolve in water for use.

Ammonic Sulphate. A strong solution of the sulphate, which has been purified by recrystallization.

Ammonic Sulphide or Sulphydrate. Pass sulphuretted hydrogen (H_2S) into 3 parts of ammonia water until it is saturated, then add 2 parts of ammonia water.

Ammonic Sulphide, yellow. Digest ammoniac sulphide with flowers of sulphur, and filter.

Argentio Nitrate. The salt in crystals dissolved in 20 parts of water.

Argentum Ammonio-nitrate. Dissolve nitrate of silver in crystals with ammonia water, 2 parts, and water sufficient to make 40 parts.

Auric Chloride. Dissolve gold in aqua regia, evaporate to dryness, add water, and filter.

Baric Carbonate. The freshly-precipitated and still-moist carbonate thrown down from solution of baric chloride, on addition of ammonia, followed by excess of ammoniac carbonate.

Bario Chloride. The salt dissolved in 10 parts of water.

Baric Hydrate. The crystallized hydrate ($\text{BaH}_2\text{O}_2\cdot 8\text{H}_2\text{O}$) dissolved in 20 parts of water, and filtered. Keep well stopped.

Baric Nitrate. The salt dissolved in 20 parts of water.

Calcio Chloride. The salt dissolved in 10 parts of water; also a saturated solution, 4 parts in 5 of water.

Calcio Hydrate. The filtered solution, prepared as directed in Part II. (Aqua Calcis).

Calcic Sulphate. The solution made by shaking gypsum with water, and filtering.

Cobaltous Nitrate. The salt dissolved in 10 parts of water.

Cupri Ammonio-sulphate. Dissolve 1 part cupric sulphate in water, 15 parts, and add ammonia water until the precipitate is nearly redissolved.

Cupric Acetate. Dissolve subacetate of copper, 1 part, acetic acid, 2 parts, in water sufficient to make 10 parts.

Cupric Chloride. Add excess of cupric oxide (CuO) to hydrochloric acid, digest, and filter.

Cupric Sulphate. The salt dissolved in 10 parts of water. The salt rendered anhydrous by heating to 205°C . (400°F .).

Cuprous Chloride. Digest cupric chloride, acidulated with hydrochloric acid, with copper turnings.

Cuprum. The metal in bright thin foil.

Ferric Chloride. The solution (see Part II.) diluted with 5 parts of water.

Ferrous Sulphate. The pure salt dissolved in cold water, 40 parts. The salt precipitate by alcohol for use in dry state.

Ferrous Sulphide. See Part II.

Iodine. The element in tincture, $\frac{N}{10}$. See Part II.

Magnesia Mixture. Mix magnesium sulphate, 1 part, chloride of ammonium and ammonia water, of each, 1 part, water, 18 parts, dissolve, and filter.

Magnesian Sulphate. The salt dissolved in 10 parts of water.

Mercuric Chloride. The salt dissolved in 20 parts of water.

Mercurous Nitrate. The salt dissolved in 20 parts of water acidulated with 1.2 parts of nitric acid, and kept in a container with some metallic mercury.

Platinic Chloride. Dissolve scrap platinum in nitro-hydrochloric acid, add ammonium chloride, and evaporate on a water-bath. Wash residue with alcohol, ignite in a crucible until it is decomposed, redissolve the resulting platinum, evaporate to dryness, and dissolve in 10 parts of water.

Plumbic Acetate. The salt dissolved in 10 parts of water.

Plumbic Peroxide. Digest red lead in hot dilute nitric acid, filter, and wash.

Potassic Acetate. The salt dissolved in 5 parts of water.

Potassic Bichromate. The salt dissolved in 10 parts of water.

Potassic Chromate. The salt dissolved in 10 parts of water. Bichromate dissolved in water and neutralized with ammonia water will do for most purposes.

Potassic Ferricyanide. The salt dissolved in 10 parts of water.

Potassic Ferrocyanide. The salt dissolved in 10 parts of water.

Potassic Iodate. To 5 parts of potassium chlorate, dissolved in 20 parts of water, add 5 parts of iodine and 1 part of nitric acid, and digest until the color of iodine disappears; boil for a few minutes, evaporate to dryness on a water-bath, and dissolve the residue in 430 parts of water.

Potassic Iodide. The salt dissolved in 20 parts of water.

Potassic Metantimoniate. Heat 1 part of antimony with 4 parts of nitre in a crucible; boil the residue, previously powdered, for several hours with 12 parts of water, and filter.

Potassic Permanganate. The salt dissolved in 10,000 parts of water.

Potassic Sulphate. The salt dissolved in 15 parts of water.

Potassic Sulphocyanide. The salt dissolved in 20 parts of water.

Sodic Acetate. The salt dissolved in 10 parts of water.

Sodic Borate. Heat until water ceases to escape and a fused mass remains. Powder, and keep in well-closed bottles.

Sodic Carbonate. The crystallized salt dissolved in 10 parts of water.

Sodic Hydrate. The fused hydrate dissolved in 20 parts of water.

Sodic Hydric Sulphite. The salt dissolved in 5 parts of water.

Sodic Hypochlorite. Liquor sodæ chlorinatæ as described in Part II.

Sodic Hypophosphite. The salt dissolved in 10 parts of water.

Sodic Phosphate. Disodic hydric phosphate dissolved in 10 parts of water.

Stannous Chloride. Dissolve 1 part pure tin in strong hydrochloric acid, in presence of a piece of platinum foil. Add sufficient diluted hydrochloric acid to make 6 parts, and keep in a stoppered bottle on some pieces of granulated tin.

Zinc. Pure metallic zinc.

MISCELLANEOUS REAGENTS.

Tincture of Litmus. Treat 1 part of litmus with 10 parts of diluted alcohol.

Blue Litmus Paper. Soak unsized white paper in tincture of litmus, and dry.

Red Litmus Paper. Soak unsized paper in tincture of litmus which has previously been reddened by a minute amount of dilute sulphuric acid.

Starch. As described in Part II.

Tincture of Turmeric. See Part II.

Turmeric Paper. Unsized white paper treated with tincture of turmeric as directed for litmus paper.

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
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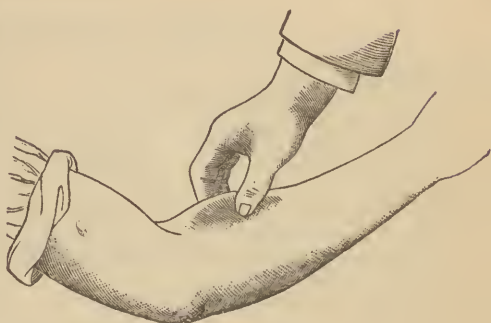
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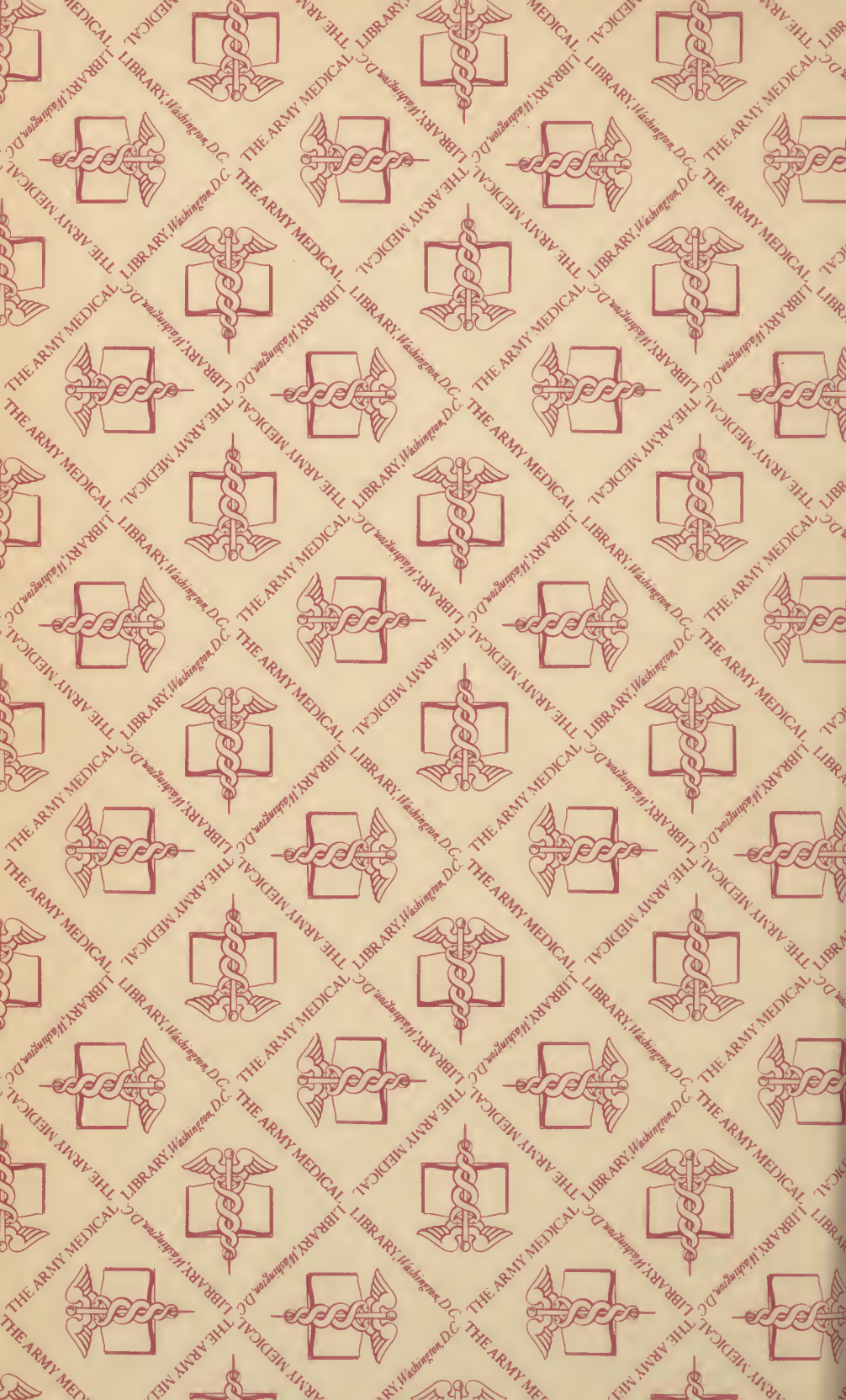
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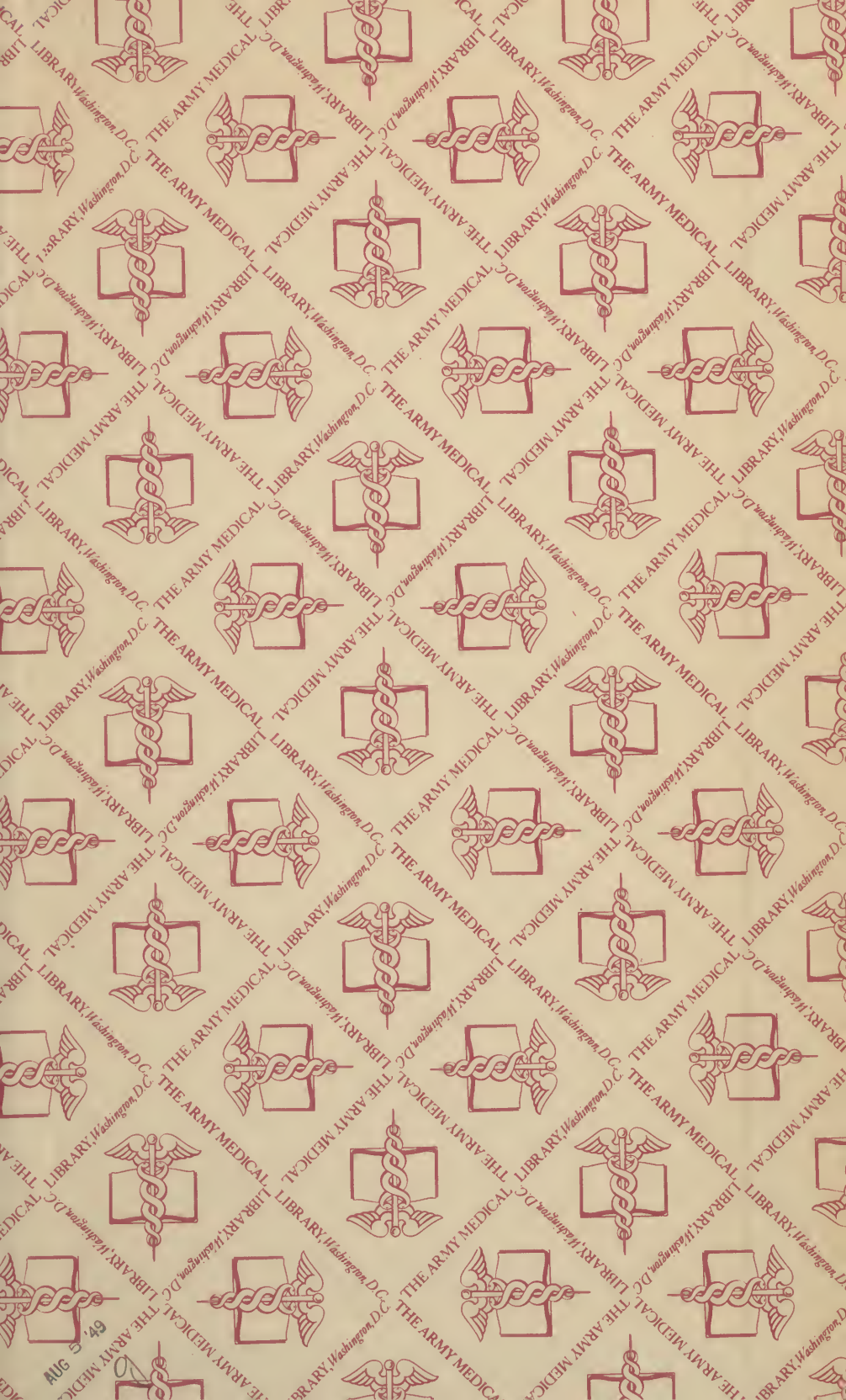
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